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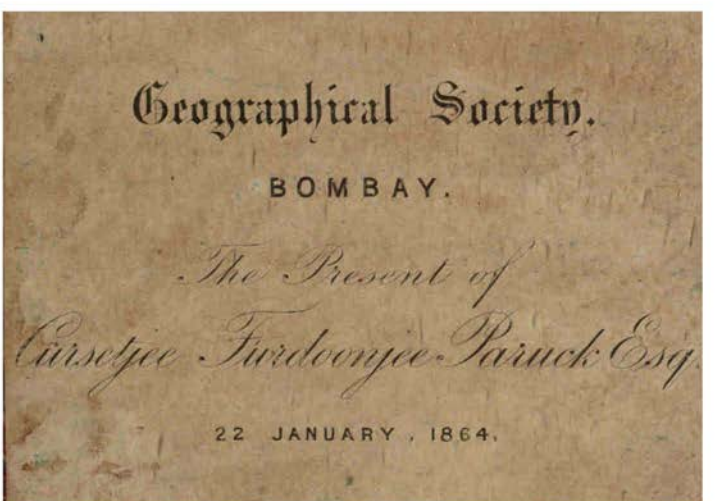

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Funchal, from above Sao Gonsalves.

MADEIRA

ITS CLIMATE AND SCENERY

A HANDBOOK FOR VISITORS.

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BY

ROBERT WHITE AND JAMES Y. JOHNSON.

SECOND EDITION.

WITH NUMEROUS ILLUSTRATIONS AND A MAP OF THE ISLAND.

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EDINBURGH:
ADAM AND CHARLES BLACK.
1860.

PREFACE TO THE FIRST EDITION.

THE following notes have been prepared at the suggestion of a few friends, who have flattered the Author by considering him fitted, from his long sojourn on the island, to furnish such information as would be useful to strangers, especially invalids resorting to Madeira.

The Author has endeavoured to furnish all the information which an experience of upwards of fifteen years' residence on the island has taught him to be necessary for the visitor. He has also attempted to supply such details regarding the climate of Madeira as may be interesting and useful, especially to those who are meditating a change, from the trying cold of England, to a milder atmosphere, or who may be interested in selecting a winter residence for others.

Without pretending to medical knowledge, the author has given his own experience of the climate,

and the results of some meteorological observations made by himself, which he has endeavoured to condense as much as possible, with a due regard to correctness, from a series of daily observations. He has availed himself of the kind assistance of resident English medical practitioners in pointing out the beneficial effects of the climate in the cure or amelioration of disease; and begs to express his peculiar obligations to Drs. Lund and Tibbetts, for their valuable information.

The description of the different kinds of grapes and wines produced on the island, may be relied upon as correct; for information on these subjects, the writer has to acknowledge his obligations to Mr. William Grant, whose long experience and excellent practical knowledge as a wine-merchant and cultivator of the grape, are well known in Madeira.

Considerable pains have been bestowed on the commercial and statistical information contained in the work; and it is hoped the explanation of the monies, weights, and measures of the island will be found useful, as great confusion prevails on these points in all the works hitherto published.

A plan has been given of a tour through the island, and such practical hints as the author knows

from experience will be useful. The distances, calculated by the time occupied, have all been carefully ascertained, and are given in a tabular form in the Appendix.

Besides wishing to record his own grateful experience of a residence in Madeira, to which he feels that he owes many years' prolongation of life, and the enjoyment of comparative health, the writer hopes this little work may be of real utility to others placed in a position similar to his own.

R. W.

MADEIRA, 1851.

PREFACE TO THE PRESENT EDITION.

THE first edition of this little work being exhausted, the preparation of a second has been intrusted to the present Editor, who possesses, at least, the qualification of a long personal acquaintence with the Island. The health of the Author did not permit him to undertake the task; nevertheless he has had the kindness to render the Editor important assistance in the collection of materials and the calculation of tables.

During the five years which have elapsed since the appearance of the first edition, so many changes had taken place, that extensive alterations were rendered necessary throughout; and the Editor deemed it better to re-write and re-cast the whole work, than merely to remove obsolete matter and substitute fresh. The old materials have of course been employed as far as they were available. But, whilst the general plan of the former edition has been adopted, several chapters, including those on the Natural History of the Island, are entirely new; and the same remark

may almost be applied to the chapters on Physical Geography, Agriculture and Gardening, the Government and General Statistics, and the Excursions into different parts of the Island. Large additions have been made to the chapter on Meteorology by way of supplement to Mr. White's valuable series of observations in 1850-51; and the information generally has been brought down to the latest accessible date.

The persons to whom the Editor is indebted for aid afforded him in various ways during the progress of the work, are very numerous. He now begs to express to each of them his thankful acknowledgments for their obliging communications and assistance; and hopes that those whose names are mentioned in the body of the work, in immediate connection with the information obtained from them, will excuse the liberty he has thus taken.

Lastly, the Editor, having spared no pains in the execution of his task, ventures to hope that the work in its present form will be as acceptable as the first edition has been to persons visiting Madeira.

J. Y. J.

London, 1856.

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A NEW MAP
OF
THE ISLAND OF MADEIRA.

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MADEIRA.

CHAPTER I.

THE VOYAGE—OUTFIT—PASSPORTS—LANDING—CUSTOM HOUSE.

I think Madeira is the pleasantest place in the world to live in. The air is very sweet and temperate, whence it is no wonder if the ancients reckoned it the Elysian Fields, and as an earthly paradise. *Moquet.* 1601.

When invalids first began to seek in Madeira a refuge from the rigours of our northern winters, the only vessels in which they could obtain a passage were extremely incommodious, and in every way ill fitted for the conveyance of persons in delicate health. Of late years, however, all this has very much changed for the better. The number of persons now making Madeira their winter quarters is reckoned no longer by tens, but by hundreds; and the means of arriving at the island have increased in the same proportion, whilst the accommodation afforded has greatly improved. First

must be mentioned two brigs, built expressly for the traffic between Madeira and England. These are the COMET of 260 tons, Thomas Partridge, master, and the ECLIPSE of 246 tons, C. B. Davis, master. The agents in London for both these vessels are Messrs. Rayden and Reid, 12 King William Street, City; in Southampton, Mr. N. M. Priaulex; and in Madeira, Messrs. Stoddart and Co. The commanders are experienced seamen, and the comfort of passengers has been carefully studied in all the arrangements. One of them leaves London about every three weeks; and passengers may either go on board at London or Southampton, where the vessel calls on her way out. The voyage from Southampton to Madeira is accomplished, under ordinary circumstances, in about fourteen days. These packets are fitted with family and double-berthed cabins, which are well ventilated and furnished with good bedding. The attendance is good, and the table liberally supplied. The passage money is £20; children and servants £10; but where there are several children it is usual to make a reduction. For wines, beer, soda water, etc. consumed on board, a separate charge is made; and the stewards expect a gratuity, which custom has fixed at ten shillings, when an unusual degree of attention has not been required. The days of sailing of these packets will be found advertised on the first page of the *Times* newspaper.

In addition to these sailing brigs, the steamers of two British companies call monthly at Madeira. *The Royal Mail Steam Packet Company* despatch a steamer from Southampton to Brazil on the 9th of each month. This steamer reaches Lisbon in four days, remains at that port from twelve to twenty-four hours, and is due at Funchal on the morning of the 17th. Here it stops from six to twelve hours before pursuing its course to Brazil. Eight days is the usual length of voyage from Southampton to Madeira. The first of the following columns shews the passage money charged for each passenger between Southampton and Madeira by the steamers outwards in September, October, November, and December, or homewards in April, May, June, and July. The second column shews the passage money during other months.

Single berthed after Cabins . .	£30	£26
„ „ fore Cabins . .	25	21
Double berthed after Cabins . .	22	18
„ „ fore Cabins . .	20	16

Children of Cabin Passengers under three years of age carried free of charge; three years, and under eight years, to pay one-fourth the Cabin passage rate paid by their parents; eight years and under twelve years, to pay one-half ditto, but not entitled to a separate Cabin. Passengers' male servants to pay ONE-HALF, and female TWO-

THIRDS of the lowest rate established for adult Saloon Passengers. Passengers pay for spirits, wine, beer, etc., in addition to their fare; 20 cubic feet of luggage are allowed to each adult passenger free of charge; and the regulations require all heavy luggage to be shipped the day before the vessel sails. Non-transferable return tickets are issued with an abatement of 25 per cent on the passage money.

The chief office of the Company is at 55 Moorgate Street, London. At Southampton, Mr. Duffel, Winkle Street; and at Funchal, Messrs. Duff, Gordon, and Co. are the agents.

With respect to these steamers, it is desirable to ascertain the precise kind of accommodation afforded before the berths are engaged, since invalids have sometimes been loud in their complaints of its deficiency. Persons going no farther than Madeira should be cautioned against the system of return tickets; for, not to mention that they frequently desire after a residence in Madeira to return to England by some new route, the vessels are usually so crowded with Brazilian passengers on the May and June homeward voyages, that no accommodation whatever can be obtained by persons at Funchal, except by purchasing berths from some of the petty officers; and prices are of course ruled by the demand. As much as £20 has been paid for a berth, over and above the regular fare.

One of the *African Steam Ship Company's* fleet of vessels leaves Liverpool on the 21st, and Plymouth on the 24th of every month, for Madeira, Teneriffe, and the west coast of Africa. When the 23d falls on a Sunday, the day of departure from Plymouth will be the 25th. The fares outwards and homewards between Plymouth and Madeira are alike—£17 for the chief cabin and £14 for the fore cabin, with a steward's fee of half a guinea. Children of cabin passengers under three years of age are carried free of charge; above three and under eight they pay one-fourth of the cabin passage rate of their parents; above eight and under twelve they pay one-half of that rate, but are not entitled to separate berths. Men servants pay fore cabin passage rate, and women servants two-thirds of the lowest rate established for adult saloon passengers. Wines, spirits, etc., consumed on board are specially charged for. Twenty cubic feet of luggage are allowed free of charge to each chief cabin adult passenger. The agents in England are Messrs. Ogilby, Moores, and Co. of 3, Ingram Court, Fenchurch Street, London; and Messrs. W. Laird and Co., Liverpool; in Madeira, Messrs. John Blandy and Sons. The time usually occupied by these steamers from Liverpool to Madeira is seven days. A degree of irregularity has hitherto attended the arrangements, both as to the day of leaving England, and the return to Madeira, which renders this mode of

reaching or returning from Madeira less desirable than it would otherwise be.

The *Compagnie Franco-Americaine* has commenced the despatching of a steamer, on the 2d of each month, from Havre to Rio Janeiro, touching at Lisbon and Madeira. The homeward bound steamer, leaving Rio Janeiro on the 18th of the month, will reach Madeira about the 8th of the following month. The voyage from Havre to Madeira and *vice versâ* will occupy between six and seven days. The first-class fare from Havre to Lisbon is 250 francs (=£9); from Havre to Madeira, 425 francs (=£17). M. J. D. Bernard is the agent at Havre, M. H. Dubeux at Lisbon, and Pedro Jorge Monteiro and Co. at Funchal. This line will considerably facilitate the transit of persons from northern and middle Europe to Madeira, the inhabitants of that part of the continent having hitherto been obliged to come to England, for the purpose of obtaining a passage to the island.

The packets of the *Peninsular Steam Navigation Company*, which leave Southampton on the 7th, 17th, and 27th of every month, offer an agreeable mode of reaching Madeira, by way of Lisbon, to those whose health permits of its adoption. The fare to Lisbon, first class, is ten guineas: A first class brig the *Galgo*, of 248 tons (Avellar, master), sails from Lisbon to Madeira about once a month,

and performs the voyage in from four to eight days. This vessel is fitted up with a degree of comfort much superior to that of other Portuguese packets. The passage money is 20 Lisbon dollars (= £4 : 10s.) including table, wine, and bedding. Messrs. Abreu and Co. are the agents in Lisbon, and Messrs. Freitas, Abreu, and Co. at Funchal. The Lisbon agents will assist in clearing the luggage at the Custom House, of those persons who arrive by any of the Peninsular Company's packets with the intention of going forward to Madeira by the Galgo. The fare from Madeira to Lisbon in this vessel is 25 dollars Madeira currency (= £5 : 4 : 2).

There is no necessity for persons who intend to spend the winter in Madeira to lay in a large supply of clothing. Such clothes as are worn in England during the spring will serve very well through the cold season in Madeira; and if lighter clothing should be found desirable, it can be obtained at Funchal as good and nearly as cheap as in London. Calico shirts are better suited to the climate than linen; flannel underclothing should not be forgotten.

During the voyage a bag with a number of pockets to hold brushes and other toilet articles will be found a useful assistant when tacked up against the side of the cabin.

The houses in Madeira not being hung with

bells, one or two good hand-bells will be found useful by persons intending to occupy furnished houses.

With regard to money, it is desirable to carry out in sovereigns as much as will cover the expense of some months' sojourn. By these means the commission usually charged by the merchants on bills or letters of credit, often amounting to three per cent, will be saved. The value of the coins circulating in the island will be explained in the Appendix.

It will be well to take one or two letters of introduction to residents at Funchal.

As to the time of leaving England for Madeira, invalids are recommended not to postpone their departure to a late period in the year. Medical men usually advise their patients to start in the latter part of September, or the early part of October. At this period the applications for berths are more numerous than at other seasons; it will therefore be prudent to apply in good time, especially when several members of a family desire to travel together. A plan of the vessel shewing the arrangement of the cabins can usually be obtained from the agents.

Persons proceeding direct to Madeira need not trouble themselves to obtain passports. No difficulty will be experienced on landing without one, and the slight fine exacted on leaving the island

amounts to no more than the sum paid for a passport in England.

Soon after a vessel has cast her anchor in Funchal roads, officers belonging to the Board of Health make their appearance, and ascertain whether there exists any impediment to communication with the shore. If the explanations as to the health of the passengers or crew are unsatisfactory, or if the vessel has sailed from a port declared to be infected, the vessel must hoist a yellow flag to show that intercourse with the land is prohibited, and the passengers must either perform the prescribed quarantine on board, or in the Lazaretto. The present Lazaretto stands at the mouth of the Ribeiro de Gonçalo Ayres, distant about a mile to the east of the city. Considerable additions have been recently made to the buildings, and a residence here is now attended with much fewer inconveniences than formerly. In the happier event of there being nothing in the way of unrestricted communication with the shore, the crowd of boats which awaited at a distance the decision of the health officers draws near, and the stranger immediately hears a loud clatter of Portuguese words, accompanied by an immense deal of gesticulation proceeding from the swarthy and half-naked fellows who warmly contend for the honour of carrying him and his luggage to land. The scene is strange and amusing; boats and men have an altogether

wild and foreign appearance. The latter seem to have a cross of the pirate or smuggler in their composition; and the former are rough-looking structures, without any of the refinement of a Thames wherry, but much better calculated to withstand the waves of the bay. If the water is much agitated the more prudent plan will be to row to the Pontinha where the passenger can easily land half a mile from the city at some steps that come down to the sea in a sheltered situation, behind the Loo Rock. Otherwise, the usual course is to land at the beach near the town. On arriving there the boat is turned with its stern to the land, and the men, skilfully making use of the crest of a wave, run the boat on the beech; then tucking up their trowsers, they hastily jump out and pull the boat, with the assistance of their comrades, out of the reach of the sea. Such a mode of arriving at *terra firma*, with the water splashing and dashing about one, the men excited and yelling their gibberish into one's ear, is rather alarming at first, but one soon becomes accustomed to it, after it is seen how cleverly the thing is managed. The stranger's impulse is to make a leap from the boat the moment he feels it grating on the shingle, but he will soon perceive the impolicy of this move, and be disposed, after a little experience, to adopt the men's advice to remain quiet on his seat. The boats are furnished

with lateral keels, and consequently do not capsize when they touch ground.

The usual charge for landing at Funchal in a two-oared boat is 300 Rs. = 1s. 3d.; in a four-oared boat 500 Rs. = 2s. 1d. The Portuguese boatmen, however, omit no opportunity of imposing on strangers, and it is therefore desirable to commit the settlement of their charges to the landlord of the house in which visitors propose taking up their abode, who will see that no imposition takes place. It must be admitted that persons on their arrival and departure usually pay more for boat hire than on other occasions, a custom which the boatmen seem to regard as an excellent and indisputable law.

Wherever landing is effected, it is pretty certain that there will be bullock cars, palanquins, and saddle horses in attendance, to convey strangers whither they will, either in the city or its neighbourhood.

The luggage being got on shore, it is taken at once to the Custom House, where it is examined by the proper officers. Though the examination is most liberally conducted, the process may possibly be facilitated by the assistance of a friend on shore, or of the landlord of the house where the visitor intends to reside. The Custom House of Madeira offers an example to all others. Visitors are politely treated, the detention of their luggage

is brief, and the charges are of trifling amount. Wearing apparel and bed and table-linen which have been in use pass free of duty. Upon silk or woollen goods not made up, the regular duty will be charged; as well as upon any unreasonable number of bonnets, dresses, or parasols which may be found. Plate, plated articles, furniture, saddles, and musical instruments are admitted duty free, upon entering into a bond that they shall be re-shipped, or the duties paid within eighteen months. Soap and tobacco in its various forms are prohibited; the Portuguese government having granted a monopoly for the manufacture and sale of these articles to a private company at Lisbon. A natural consequence of this monopoly is that the island is supplied with execrably bad soap and tobacco at exorbitant prices.

"I do not know a spot on the globe," says Captain Marryatt, "which so astonishes and delights, upon first arrival, as the Island of Madeira. The voyager embarks, and is in all probability confined to his cabin, suffering under the dreadful prostration of sea-sickness. Perhaps he has left England in the gloomy close of autumn, or the frigid concentration of an English winter. In a week he again views that terra-firma which he had quitted with regret, and which, in his sufferings, he would have given half that he possessed to regain. When he lands upon the island, what a

change! winter has become summer; the naked trees which he left are exchanged for the luxuriant and varied foliage; snow and frost for warmth and splendour; the scenery of the temperate zone for profusion and magnificence of the tropics; a bright blue sky; a glowing sun; hills covered with vines; a deep blue sea; a picturesque and novel costume; all meet and delight the eye, just at the precise moment when to have landed on a barren island would have been considered a luxury."

CHAPTER II.

MEDICAL DIRECTIONS FOR INVALIDS ON THE VOYAGE AND DURING A RESIDENCE IN MADEIRA.

SOME notes, intended for the guidance of invalids on the voyage to Madeira, and during a sojourn on the island, from the pen of Dr. Lund, an English physician, who has practised for several years at Funchal, appeared in the first edition of this work. Having been found useful to such persons, they are now, with Dr. Lund's sanction, almost literally reprinted.

Invalids resorting to the island of Madeira for the recovery of their health are chiefly those suffering from pulmonary diseases. Of such invalids there are two classes; the first class comprehends those with whom the complaint is in its early stage, during which period the climate generally acts beneficially in arresting its progress; the second class

is composed of those in the last stage, where no reasonable hope of recovery can be given. As to the first class there is no doubt that many more persons would derive benefit from the climate did not their own imprudent conduct stand in the way of their experiencing relief; and as to the second class, there is equally little doubt that the progress of the disease is often much retarded, and life's frail tenure prolonged; whilst all the symptoms become milder than at home, and the remaining term of existence is passed with comparative comfort. There are persons who have now been living many years on the island, whose cases, on leaving home, were pronounced hopeless; some, I know, have long had large portions of the lungs destroyed; these are the fortunate exceptions to the almost universal fatality of confirmed consumption, and shew that, even under the most adverse circumstances, hope is not to be entirely given up. These persons ride and boat, enjoy the society of their friends, make voyages home in summer, and live a comparatively happy life.

It is to be regretted that invalids who might derive benefit from the climate of Madeira in an early stage of their disease, too often lose invaluable time by frittering it away at some place in England, the climate of which cannot possibly be so advantageous as the mild and equable climate of Madeira. They dread the voyage; and the advice to take

cod-liver oil and remain in England, which it has lately been the fashion with some medical practitioners to give, is no doubt a great inducement to delay their departure. That such advice is not the best, is evident from the fact that the opportunity of constantly respiring pure air, and taking regular exercise, cannot be enjoyed, during the winter and spring, by invalids in England; where they must necessarily live shut up in rooms, and only enjoy the open air for a few hours during that rare occurrence, fine weather, and even then are obliged to wear a respirator, or be closely muffled up. With these disadvantages the use of cod-liver oil must prove less beneficial than it would do under more favourable circumstances. It is freely used in Madeira, though in moderate doses, and undoubtedly improves the functions of assimilation and conversion, enabling the blood to deposit healthy lymph, instead of albumen, which constitutes tubercle; but for the removal of congestion and recent thickening of the lung, one of the chief means is exercise and the free inhalation of pure air. Again, where one part of any organ is prevented by disease from doing its duty, it becomes doubly imperative that the remaining portion of healthy structure which has double work to perform, should be placed under as favourable circumstances as possible for the more efficient discharge of its increased functions: hence the necessity of a con-

stant supply of pure air, when only a limited part of the lung is acting, and the importance of selecting large and well ventilated sleeping apartments. These circumstances shew that if a change is to be made, it should be to some decidedly good climate possessing advantages sufficient to repay the invalid for the sacrifice he undergoes in leaving the comforts of home. In my own case, I acted, many years ago, according to this advice and with the most beneficial results. The late Dr. Andrew Combe, in writing to a friend (see his Life and Correspondence), says, "*If I must go abroad*, I shall most likely return to Madeira, on the simple ground that, if I must forego the pleasures of home, it is better to resort at once to the *most* advantageous climate than to adopt the half measures of going to Italy, Jersey, or the south of England."

For a trustworthy account of the climate of Madeira, as reported by two physicians long resident on the island, Sir James Clark's book on Climate can be referred to, and a residence of sixteen years on the island enables me to confirm the very great accuracy of their remarks. Having also made inquiries, for some years past, from invalids who have wintered at different favourite localities, such as Pau, Pisa, Nice, Rome, Malta, Malaga, and Egypt, how the climate of Madeira ranked in comparison with those they had tried,

the answers have universally been in favour of Madeira. That of Egypt is the only one approximating to it; but in that country many drawbacks exist.

Some complain of the dulness of Madeira, and the want of gaiety, or places of public amusement, but, medically considered, these are far from advantageous; indeed, the late Dr. Renton remarked, that if the winter in Madeira proved a little worse than usual, his patients generally progressed more favourably, for the simple reason that they then acted with greater prudence.

In addition to those suffering from chest complaints, there are other classes of invalids who are much benefited by a sojourn in Madeira; such as those labouring under morbid conditions of the blood, and the diseases arising from this state, rheumatism, scrofula, kidney affections, and various chronic diseases, imperfect recoveries after fevers, and those who cannot resist cold, and consequently suffer from internal congestions and imperfect action of the skin. Persons suffering from affections of the brain and nervous system, or a tendency to apoplexy, asthma, chronic diarrhœa, and dysentery, should not be sent to Madeira.

As to the best mode of reaching the island I am so fully convinced of the great superiority of the regular Madeira sailing packets, in affording the greatest comfort, and attention to invalids, that I

cannot forbear recommending those who are in delicate health to avail themselves of these conveyances; and this advice I give from my own experience of the inconvenience and lack of comfort on board the steamers, and those sailing vessels which merely touch at the island. The regular packets are all first-class vessels, fitted up chiefly for the accommodation of delicate persons, are amply provided with all invalid requirements, including a medicine chest, and have a sufficient number of stewards to ensure good attendance. The steamers touching here on their way to the Brazils and the coast of Africa, certainly perform the voyage with greater speed and regularity than sailing vessels, but a quick passage from England to Madeira, especially in September or early in October, is positively detrimental to a delicate person. The transition from cold to heat is very trying, and apt of itself to occasion illness. A passage of from 12 to 14 days is decidedly preferable; the change is then gradual, and the constitution becomes accustomed to the greater warmth which prevails in Funchal till after the first autumnal rains.

A mild aperient taken previous to embarking will be of advantage in mitigating the excessive nausea of sea-sickness; and a good form is three grains of blue pill and five of compound aloetic pill, made into two pills, and taken at bed-time. When sea-sickness comes on, the best plan is to

lie down, and let the stomach be completely evacuated, drinking occasionally small quantities of fluid. Murray's fluid magnesia not only corrects acidity, but renders the vomiting easier. After the violence of the vomiting has subsided, small quantities of stimulating food, and drink can be taken; fresh air on deck is also necessary. Preventives for sea-sickness, such as creosote, etc., allay the vomiting for a time, but leave intolerable nausea.

Much after mischief would be avoided if invalids would live moderately during the voyage, and prevent constipation by occasionally taking a mild aperient, such as the compound rhubarb pill. If stronger medicine be required, an aloetic or colocynth pill may be taken, but in all chest diseases, and more especially in the advanced stage, purgative medicines must be used with the greatest caution.

In cases of hæmoptysis, or spitting of blood, where there is no medical assistance to be obtained, the following general directions may prove of service. If the attack is slight, living very abstemiously, keeping quiet, and observing perfect silence, with a saline purgative, may be sufficient; should the attack be more violent, it will be advisable to dissolve one tea-spoonful of common salt in a small quantity of cold water, and drink it off directly; this dose can be repeated in half-an-hour if neces-

sary. Should the bleeding still continue after the use of the salt, and after free purgation with Epsom salts, astringents must be used, as the infusion of matico, made by pouring one pint of boiling water over one ounce of the leaves, and straining it when cold; a wine-glassful of this can be taken every three hours. Lead is also a valuable astringent, but it cannot be safely employed in the absence of professional aid. Ten to fifteen drops of diluted sulphuric acid in half a wine-glass of water, taken two or three times during the day, is also useful.

Upon landing in Madeira, the invalid must carefully avoid all causes of excitement in moving to his place of residence. For the first few days it is requisite to live very prudently, to avoid too much indulgence in fruit, and to drink very little, if any, beer or wine; indeed, strict moderation must be the rule not only now but during his whole sojourn. Any exercise which materially quickens the pulse and breathing, should be carefully avoided. Walking in the hot sunshine, or up the hills, is especially to be eschewed. During damp or wet weather, and particularly after sun-set, the invalid should keep within doors. The general rules for restoration to health are comprised under the heads of fresh air, exercise, regulated diet, attention to the skin, and to the keeping up of any deficient function. The special application of these must be varied to

suit each individual case, but all will be benefited by strict temperance, by adhering to regular and early hours, and by the avoidance of all excitement.

A work, entitled *Physiology applied to Health and Education*, by Dr. A. Combe, is an excellent guide in matters relating to health; it should be read, and its directions followed by all invalids, who will then understand the reasons of many of the directions given by their medical attendant, and will thus be enabled to follow out his instructions not only with more profit but with less irksomeness to themselves than when left in ignorance.

The late Dr. Renton, who practised for several years on the island, and had ample opportunities of observing how frequently invalids mismanaged themselves, wrote some words of warning, which we here reproduce.

I have seen, I may safely say, *scores*, especially of young people, buried here, who, but for their own folly, or, to speak more charitably of them, for want of friends at home in their lodging-houses to act as a check upon their proceedings, might now have been in the enjoyment of a very tolerable state of existence, and which, with prudence on their part, might, in a mild climate at least like this, have been prolonged for an indefinite period.

There is a general notion that hard exercise is productive of great strength, and in the healthy this may perhaps pass current; but the case is widely different when we have consumptive invalids, or generally delicate subjects to deal with. With respect to the former, I have no hesitation in saying, that anything approaching to violent exercise is, in this mild climate, invariably prejudicial, and that this is one of the most frequent causes of the failure of a measure which, under different management, might have proved a lastingly beneficial one. And here it is not merely the ill effects arising from the general excitement, and the shaking of diseased or tender organs that are to be looked to, for there is another very obvious source of mischief to be dreaded—that of ascending rapidly (often when the roads are very steep, two or three thousand feet), to a great elevation above the town or its neighbourhood, and being thus exposed within half an hour, perhaps, and remaining so, to a temperature of 8° or 10° lower than what they have been accustomed to. The number which these parties are composed of too, adds greatly to the excitement, and must prove injurious to any invalid, except a hypochondriacal one. Anything short of a hard gallop is considered as no exercise by young people, and it turns out that sooner or later they find they have been galloping harder than they were

aware of to their graves. I have dwelt on this subject from a thorough conviction of its vast importance, and from its being one of the chief causes of want of success in the treatment of incipient pulmonary disease in the island. Invalids of this description ought generally to be thankful if they keep their ground well during the first winter, and ought to be warned before leaving home, *that even negative benefit is only to be obtained* by living quietly in the enjoyment of a mild atmosphere, doubly mild and soothing from the quantity of moisture which it is capable of holding in solution.

No *young* pulmonary patient should be sent hither, unless he or she be accompanied by some prudent or watchful friend. It is too generally the case that a number of young men meeting together in the same boarding-house, encourage each other in doing what is improper for them, thus often rendering their residence here worse than useless.

A few sentences embodying advice which it would be well if invalids sent from home for the improvement of their health would attend to, are extracted from Sir James Clark's valuable work on Climate, and may appropriately close this chapter.

"Too much," says he, "is generally expected from the simple change of climate. It often happens that

from the moment the invalid has decided upon making such a change, his hopes are fixed solely upon it; while other circumstances not less essential to his recovery are considered of secondary importance, and sometimes totally neglected. This is an error not always confined to the patient; his medical adviser frequently participates in it."

"I would strongly advise every person who goes abroad for the recovery of his health, whatever may be his disease, or to what climate soever he may go, *to consider the change as placing him merely in a more favourable situation for the removal of his disease;* in fact, to bear constantly in mind that the *beneficial influence of travelling, of sailing, and of climate, requires to be aided by such a dietetic regimen and general mode of living, and by such remedial measures as would have been requisite in his case had he remained in his own country.* All the circumstances requiring attention from the invalid at home should be *equally attended to abroad.* If in some things greater latitude may be permitted, others will demand even a more rigid attention. It is in truth only by a due regard to all these circumstances that the powers of the constitution can be enabled to throw off, or even materially mitigate in the best climate a disease of long standing."

"That great and lasting benefit is to be derived from a temporary residence in the climate of Madeira, many living examples, Dr. Renton re-

marks, sufficiently prove. But even under such comparatively favourable circumstances, it ought to be strongly impressed on the mind of the invalid, that half-measures are worse than useless, and that no advantage is to be derived from climate, unless it be seconded by the utmost caution and prudence on his part."

CHAPTER III.

LIFE AT FUNCHAL—HOTELS AND BOARDING HOUSES FURNISHED HOUSES — SERVANTS — WASHING — HORSES — BULLOCK CARS — PALANQUINS — HAMMOCKS — BOATS — SHOPS — LIBRARIES — DIVINE SERVICE — CEMETERIES — PHYSICIANS — SCHOOLS POST OFFICE — AMUSEMENTS — RETURN TO ENGLAND.

I should think the situation of Madeira the most enviable on the whole earth. It ensures almost every European comfort, together with almost every tropical luxury. The seasons are the youth, maturity, and old age of a never ending, still beginning spring.—*H. N. Coleridge.*

Hotels and Boarding-Houses.—Furnished lodgings are not to be obtained at Funchal, but the boarding houses are numerous, and generally well managed. The majority of them are kept by English people ; the rate of charge for each person varies according to several circumstances, from 35 to 50 dollars per calendar month. This charge does not cover a separate sitting room, nor wine, spirit, or malt liquor. A general table is usually provided, but a separate sitting room can be

obtained at an extra charge of 10 dollars per month. The charge for servants and children is one half the full charge. On leaving the house, it is customary to present a small gratuity to the servants of the establishment. The principal boarding-houses are here given in alphabetical order. They are all situate within the limits of the town, except those to which the figures (1) and (2) refer, and these stand respectively at the height of 298 feet and 525 feet above the sea. In selecting his abode for the winter, the stranger's best course is to consult his friends or medical adviser. He can usually obtain accommodation for a few days at any of the boarding houses and hotels, until he has had time to look around him, and make his selection of a permanent abode for the winter:—

Counis, D., 22, Rua do Aljube.
Fernandes, Snr. Anto. Pio, 7, Rua do Pinheiro.
Freitas, J. H., 43, Rua das Hortas.
Giulietti, European Hotel, 1, Travessa d'Alfandega.
Hasche, J., 15, Calçada da Santa Clara.
Hayward, Mrs., 4, Rua de Saõ Pedro.
Hollway, J. H., Caminho do Meio (1), and 11, Rua de Joaõ Tavira.
Jervis, Snra., 35, Rua da Carreira.
Luiz, J., 20, Rua dos Pintos.
Luscomb, H., 59, Rua da Carreira.
Medinas, Snras., 12, Rua dos Pintos.
Miles, James, 14, Rua dos Pintos.
Pestana, Madam, Caminho de Sta. Luzia Velha (2.)

Reid, Wm., 5, Rua do Mercado.
Shaw, Mrs., 19, Rua do Castanheiro.
Wardrop, Miss, 36, Rua da Carreira.
Yates, Jno., Family Hotel, Caes.

At Giulietti's Hotel, and at Mrs. Wilkinson's, 6, Rua d'Amoreira, baths (hot, cold, shower, sea-water, etc.) can be obtained at moderate charges.

Furnished Houses.—The neighbourhood of the town abounds with furnished houses, with gardens attached, (here called *quintas*), which can be hired by families who prefer an establishment of their own to living in a boarding house. They are not, however, let by the month, unless the season has far advanced. A list of the houses usually let to strangers, with their heights above the sea, as carefully ascertained by Mr. White by means of the aneroid barometer, is given in Appendix, and information regarding them can be obtained from Mr. John Payne, or Messrs. Carvalho and Co.

In hiring a furnished *quinta*, a written agreement should be made with the landlord, specifying the terms of engagement. One half the rental is usually specified on taking possession, the other moiety at the expiration of three months. The inventory of the furniture should be carefully examined, and any required additions mentioned before concluding the agreement. One or two blankets and one counterpane are furnished to each bed; but all bed and table linen, towels, and plate of every

description, must be provided by the occupants. These houses can be hired for the whole year for very little more than the winter's rent. There are no taxes of any kind payable in respect of them. The landlord usually claims a right to the produce of the garden, unless excluded by special stipulation. Some of the hotel keepers will make an arrangement with strangers hiring houses, to supply them at a given rate per month, with board, servants, linen, etc., and they are thus saved a great deal of the trouble which would otherwise be cast upon them in undertaking the charge of a house in a foreign country.

Servants.—Little difficulty will be experienced in obtaining the requisite number of "helps." Mr. Payne or Messrs. Carvalho will render assistance here also, and the written characters they will produce from former employers will aid in the selection. Much menial work is performed by men servants, such as cooking and cleaning the house. The behaviour of the whole class is obliging and civil, but many of them require close looking after, or they will prove arrant thieves. As they are necessarily employed in purchasing most of the articles of consumption required in the house, the system of pass-books is recommended for adoption as far as possible. They are generally hired by the month, the wages varying according to their qualifications :—

For a superior cook, from 7 to 9 dols.	}	Men servants.
„ good plain do. . 5 to 7 „		
„ „ waiter . . 6 to 9 „		
„ house or table-maid 3 to 5 „		
„ stable-boy . . 3 to 4 „	}	Without food.
„ burriqueiro, groom, or hammock bearer 5 to 8 „		

The higher rate is usually expected when the servant can speak or understand a few words of English. Visitors are recommended not to bring out servants from England, unless they are tried family domestics. Ordinary servants are perfectly useless at sea, for it is generally remarked that they give way to the *mal de mer* much more than their masters and mistresses. On the island the trouble and expense they occasion are frequently not repaid by the value of their services. In boarding houses, as their habits differ from Portuguese servants, they require a separate table. Moreover, they are apt to become either discontented or more independent than is agreeable to their employers.

Washing.—The charge for washing varies from 1500 reis to 2000 reis (6s. 3d. to 8s. 4d.) per month for each person, or from 250 reis to 300 reis (1s. 1½d. to 1s. 3d.) per dozen pieces. Linen is usually washed at the bottoms of the ravines in order to have the benefit of a good supply of water, and if any one will take the trouble to look over the parapet of a bridge, he will probably see the

women at their labours. They deal rather roughly with the coarser articles, beating them lustily against the stones in the bed of the stream. The common expression for sending clothes to be washed is there *mandar a roupa ao ribeiro* (sending linen to the river).

Horses.—In consequence of the irregularity of the ground, locomotion in Madeira is to all a fatiguing, and to invalids a dangerous, operation without assistance. Those who are strong enough have recourse to horses, which do not here partake of the appearance of park hacks. A few are bred on the island, but the greater number have been imported from England or the Peninsula. Prices vary from 40 dollars for ponies to 300 dollars, which would be considered a fancy price for a very superior animal. For long journeys, or for the rough and narrow roads at the north, small horses not exceeding twelve hands are to be preferred, and for 70 to 80 dollars (£14 : 11 : 8 to £16 : 13 : 4), a fair animal of this class may be obtained. The expense of keeping a horse will amount monthly to 14 or 15 dollars made up in this way—milho or maize 3 dollars, grass 3 dollars, bran ½ dollar, shoeing 1 dollar, groom 6 dollars. If the visitor is in a boarding house, there will be stable rent to add, say from 1½ to 2 dollars per month. Fresh grass is brought daily to the stable, and a bundle costing fivepence is sufficient for one horse. Milho

is given in place of oats; the usual allowance when the horse has a moderate amount of work is the quarter of an *alqueire*. The *alqueire* is continually varying in price from 350 reis to 500 reis. This grain will undoubtedly go further when it is crushed. The charge for crushing is taken in kind, namely one-sixteenth part. It is recommended to give a sixteenth of an *alqueire* of bran with every quarter of an *alqueire* of crushed milho.

In comparing the cost of buying with the cost of hiring a horse, the visitor must reckon upon losing at least one-third when he comes to sell at the end of the season. The hire of a horse by the hour is 300 reis (1s. 3d.) with an occasional *pour boire* to the attendant. By the day, a horse is charged 2 dollars (8s. 4d.) and 200 rs. (10d.) are paid to the *burriqueiro*. A horse can be hired by the month for from 25 to 30 dollars (£5 : 4s. to £6 : 5s.) according to the style of animal. The *burriqueiro* will expect from 1½ to 2 dollars (6s. 3d. to 8s. 4d.) for the same period. These charges do not apply to excursions to the north, nor indeed to any long excursions attended with great fatigue and risk to the horse. For such journeys an extra charge is demanded. The *burriqueiros* are rough looking fellows who act as grooms, and think it their duty to accompany the animals under their care wherever they may be taken. They are thus always at hand to render the rider

assistance; to hold his horse when he alights, or to guide him in his excursions into the country. They are in the habit of keeping up with the horses at every speed, and have a singular trick of holding on by the tail in ascending the hills. Mr. Sutcliffe is the only English livery stable-keeper at Funchal; but there are several Portuguese who follow this business with more or less reputation for honesty.

The roads being unfit for wheeled carriages, various expedients are adopted in place of such conveyances. Within the last few years covered cars on sledges, drawn by bullocks, have been much employed. The rate of progress is of course very slow, and the roads will not admit of their being taken far from town, but they are very safe conveyances, and are well suited to invalids and ladies, being more sociable than palanquins. They can be hired for 300 rs. (1s. 3d.) the hour, 2 dollars the day, or 30 dollars the month, including bullocks. Persons having private cars can engage a pair of bullocks and driver for about 800 rs. (3s. 4d.) the day, or 20 dollars (£4 : 3 : 4) the month. If taken to the country a special agreement should be made. The usual charge to the Mount Church is 1200 rs. (5s.) *

* In the time of Charles V., the wealthiest Spaniards made use of vehicles drawn by oxen. We are told how the whole population of the cities turned out to look at the chariot drawn by horses which a servant of the emperor took to Spain.

The *palanquin* is a kind of settee suspended at the distance of about twelve inches from the ground from a long pole, each end of which is borne on a man's shoulder. Though furnished with curtains and a cushioned seat, they are not pleasant for a long journey, in consequence of the cramped posture of the person carried. For persons who are seriously indisposed, and for long excursions, the hammock is much more comfortable and much less cumbersome to the bearers than the *palanquin*. In this the person carried lies at length in a sort of net variously ornamented, and suspended at each end from a pole, likewise borne on men's shoulders. By means of pillows, cushions, and a curtain thrown over the pole, a comfortable nest is made in which sick persons can take the air without the least fatigue. Palanquins and hammocks can be hired at 100 rs. (5d.) the journey; each man expects 150 rs. (7½d.) for the hour. If hired by the month, 6 or 7 dollars are paid to each bearer, and 2 or 3 dollars for the palanquin or hammock. For long excursions a special agreement should be made, and it is desirable on such occasions to obtain stronger bearers from Santa Cruz or Sant'Antonio da Serra, who will expect 600 rs. or 800 rs. (2s. 6d. to 3s. 4d.) per day according to circumstances. It is very surprising to see how steadily the bearers will keep to their work on a long, hot day. Few employments can be more laborious than that of carrying

a hammock over the rugged mountains of Madeira in warm weather, yet there is always a crowd of applicants for the work, and those whose services are not retained go away disappointed. To lighten their fatigues the men are accustomed to cheer themselves with a sort of rude chant, much more agreeable to themselves than to their "fare." If he is of heavy weight, it may be well that he does not understand Portuguese, for, like the palanquin bearers of India, they indulge without much scruple in sarcastic remarks in their antiphonal performances. On the other hand, a lady of delicate proportions is sure to have showered upon her an infinity of complimentary expressions, combined with grateful acknowledgments for her goodness in being so airily light.

Boats.—Boating is strongly recommended by medical men to chest invalids in favourable weather. The boats are well managed and clean; they are provided with cushions and awnings to be mounted when the sun is hot. A boat with two rowers can be hired at 300 rs. (1s. 3d.) the hour, or 1200 rs. (5s.) the day. With four rowers, 500 rs. (2s. 1d.) per hour is charged, or two dollars (8s. 4d.) per day. For a long distance, such as to the Fossil Bed or Machico, an additional sum of 400 rs. (1s. 8d.) is usually paid. Many of the boats can hoist a sail, and with a little wind cut through the water very easily. From the

heights about Funchal these sailing-boats look extremely pretty as they glide through the water in the bay under the influence of a gentle breeze. Large boats of clumsy construction, rudely ornamented with a stripe of red paint and a zig-zag line, are continually passing between the villages on the coast and the capital, bringing in country produce and taking back imported articles. Lines can be obtained from the Funchal boatmen by those who care for the amusement of fishing. As, however, the lines employed are from thirty to sixty fathoms in length, it may be readily conceived that the labour of drawing them up is greater than an invalid can prudently exert.

Shops.—Many persons leave England with the idea that few of the necessaries, and none of the luxuries of life, can be obtained at Madeira. They therefore load themselves with provisions and articles of clothing as if they were about to undertake a voyage round the world. This opinion is quite erroneous, for almost every article, whether of food or clothing, can be procured at Funchal, at prices little exceeding, and in many cases less than the cost in England.

The principal grocers and provision-dealers are Mr. John Payne, Rua dos Inglezes, near the Custom-house, and Messrs. J. A. Carvalho and Co., Rua do Aljube, near the Cathedral. Excellent bread is made at both these establishments. Mr. Payne has, in

addition, a shop for the sale of crockery and glass. He will afford reliable information as to furnished houses; and he is frequently able to cash bills on London, without discount for commission.

The mercers' and drapers' shops kept by English persons are—

The "British Warehouse," Grant, Rutherford, and Co., No. 1, Travessa d'Alfandega.

The "Glasgow and Manchester Warehouse," F. Wilkinson and Co., 14, Travessa d'Alfandega; and Alexander Sheffield, 2, Travessa d'Alfandega.

There are also several respectable Portuguese shops, among which may be mentioned:—

Bastos and Co., No. 14, Rua dos Mercadores.

F. Luiz Perreira, No. 19, Rua dos Mercadores.

F. Gomes e Filho, No. 3, Rua de Bettancourt; and Victorino F. Nogueira, No, 20, Largo de Saõ Sebastiaõ.

At the store of John Mason, Travessa d'Alfandega, a miscellaneous collection of articles, such as books, stationery, plated goods, saddles, and hardware, may be procured. Mr. Mason has a circulating library, the subscription to which is 600 rs. (2s. 6d.) per month, or five dollars (£1:0:10) per annum. He receives orders for English books, and forwards parcels to England.

A. C. Ribeiro has a shop, No. 19, Rua dos Pintos, where boots, shoes, needlework, marquetry,

and other wood-work, with a large variety of fancy articles, can be obtained, many of which are the productions of native industry.

Ironmongery and hardware are to be had at Bastos and Co.'s, No. 3, Rua dos Mercadores, and at other places.

Pianofortes are let on hire by Mr. John Payne, Messrs. F. Wilkinson and Co., and Snr. de Freitas, 43, Rua das Hortas. The usual charge is about 48 dollars (£10) for the season, and for the year from 60 to 70 dollars. Instruments are allowed to pass the custom-house free of duty, on a bond being given that they shall be reshipped within 18 months.

Drugs of good quality may be obtained from Mauricio d'Andrade (*Botica dos dois Amigos*), Rua da Igrejinha; Gerardo J. de Nobrega, Rua da Princeza; and M. d'Ornellas, Rua dos Pintos.

The principal gold and silversmiths in Funchal are—

Vicente Joaõ de Faria, 2, Chefariz, Largo de Saõ Sebastiaõ.

Roberto C. de Nobrega, 11, Rua Nova de Saõ Pedro.

Joaõ Antonio da Costa, 17, Rua da Carreira.

Francisco Pedro Alvares, Rua do Principe, is said to be a skilful "artist in hair;" and there are others who undertake to make bracelets, chains, etc., of this material.

The shops of Funchal have very little to recommend them externally, and the place would in this respect be at a disadvantage compared with any provincial town in England one-tenth its size.

Libraries and Reading Rooms.—At the *English Club*, near the Cathedral, there is a well-selected library, containing upwards of 2300 volumes. Many English and a few French and Portuguese newspapers and periodicals are regularly received. The club contains a billiard-table. Visitors are admitted by ballot, on the introduction of a proprietor. The subscription is 3 dollars (= 12s. 6d.) per month, 8 dollars (= £1 : 13 : 4) per quarter, 15 dollars (= £3 : 2 : 6) per half-year, or 24 dollars (= £5) per annum. At the *Portuguese Club*, Rua do Perù, the principal Portuguese and French, and a few English newspapers, are taken in. There is a good billiard-table, but no library. Tea is supplied to subscribers every evening. A ball occasionally takes place here during the season. The subscription is 3600 rs. (= 15s.) per month for strangers, who are admitted by ballot, as at the English Club. The *Commercial Rooms*, near the *Caes* (pier), receive many English and foreign newspapers. The arrival and departure of vessels and passengers are regularly noted at these rooms, in books kept for that purpose. A pleasant verandah affords an agreeable lounge and an uninterrupted view of the shipping in the bay and the signals

on the Loo rock. For a subscription of two dollars (8s. 4d.) a stranger obtains admission for six months. The Municipal Chamber of Funchal has a library of 1800 volumes, more than half of which consist of old theological works from the suppressed monastery of Saõ Francisco. There are, however, some good English and French publications of modern date. The public has free access to this library, but the removal of books is not allowed. Lending libraries are attached to the two English churches and the Presbyterian church, from which books can be obtained for twelve months on payment of a dollar.

Divine Service according to the rites of the Church of England is performed by the Government chaplain in a neat chapel surrounded by a pretty garden in the Rua da Bella Vista. The ground was purchased by the British Factory, in 1810, at a cost of 5435 dollars; and an additional piece was bought some years later for 840 dollars, with the intention of erecting upon it a house for the chaplain, which, however, has never yet been built. The chapel was paid for by subscriptions raised among the British residents, and by means of a voluntary impost of 600 rs. (2s. 6d.) per pipe on the wines exported by them. From want of funds, and various other difficulties, it was not ready for public worship till March 1822, when the total cost had been not less than 40,000 dol-

lars, or nearly £10,000 sterling, "an unconscionable sum of money," said H. N. Coleridge. The building was designed, and its erection superintended by Mr. Veitch, a former consul. The laws of Portugal at that time did not allow it to be erected in any of the usual forms of a Christian church, and it has assumed the shape of an Ionic temple. One-half the chaplain's stipend is paid by the British government and the other half by the residents. Each sitting costs six dollars (£1, 5s.) for the year, or one dollar (4s. 2d.) per month. In the case of a family requiring several sittings, a lower rate of payment is made.

In consequence of dissensions which arose a few years ago amongst two sections of the resident members of the English Church, the High Church party, as it is usually called, ceased to attend the Government chapel, and opened a place of worship in the Rua das Aranhas, where service is still regularly performed.

The Presbyterians hold their meetings for divine worship at a house, No. 1, in the Travessa do Surdo, where service takes place according to the forms of the Free Church of Scotland. A sitting costs six dollars (£1 : 5s.) for either the year or season.

Previous to the present century, the British merchants, although a numerous body, were without the services of a resident clergyman. Whenever vessels with a chaplain on board anchored in

the bay, he was requested to perform church service at the consul's residence during the Sundays he remained; and was usually remunerated by the Factory by a present of a box of preserved citron, value, in 1774, six dollars.

Cemeteries. — The British possess two cemeteries at Funchal, one known as the Residents' Burying-ground, the other as the Strangers'. The former began to be used in 1764, previous to which time the bodies of Protestants dying in Madeira were thrown into the sea, not being allowed a resting-place on land. So strong were the prejudices of the natives, that even after the Portuguese government had granted the British an interment ground, it was necessary to employ a guard of soldiers at funerals to protect the corpse and the mourning party from insult. This cemetery was formerly called *Laranjeira* (the Orange-tree) by the Portuguese. During the administration of General Beresford in 1808, another piece of ground in the immediate neighbourhood of that just mentioned was purchased for the purpose of receiving the corpses of the British soldiers dying at Madeira. It has ever since been devoted to the interment of strangers dying here.* This

* In 1852 a piece of ground was bought for the purpose of making an addition to the Strangers' Cemetery. Part of the ground was laid out as a garden, and a lodge for the gardener was built. The cost of the land, walls, buildings, etc., amounted to 10,613 mil-reis = £2211.

piece of ground is planted with tall cypresses, and the tombs are half concealed by luxuriant heliotropes, geraniums, rose-trees, and other plants, over which hang the large leaves and snow-white flowers of the datura. The spot, though inspiring feelings of profound melancholy, has a pleasing appearance, and we linger not unwillingly among its fragrant flowers, to read the simple tale of those who, when attacked by disease in the bloom and joy of youth, sought a relief at these shores for their sufferings, and yet only found that relief in the grave, far removed from friends and home.

On the east of the city, adjoining the road to Santa Cruz, a small plot of ground has been appropriated as a cemetery by the Jews, of whom there are several residing at Funchal. An inscription in Hebrew over the entrance terms the place "House of the Living," and an extract from Deuteronomy embodies the date 5611, or 1851 according to our way of reckoning.

Physicians.—The English physicians practising at Funchal are—

Dr. Broughton, Santa Luzia.
Dr. Lund, Santa Clara.

The usual fees are one guinea for the first visit, and half a guinea for each succeeding visit; but where the visits or examinations are periodical, or at long intervals, a guinea fee is expected for each.

It is not at all necessary to carry a stock of drugs to Madeira, good drugs being dispensed at moderate prices by the druggists previously mentioned. The invalid is counselled to apply to some medical practitioner soon after landing, and, where the case is not one that requires constant attention, to obtain from him some general instructions for his guidance during his residence on the island.

Schools and Masters.—The Rev. Mr. Dorsey, formerly of Glasgow, has a school for English boys; and there are one or two schools kept by English persons, where younger children are instructed. As a teacher of Portuguese Senhor Marcelliano, as a teacher of French M. Duval, are well spoken of. There is, however, no necessity for visitors to give themselves the trouble of acquiring a knowledge of Portuguese, since servants who speak English can be easily procured, and several of the Portuguese shopkeepers are also acquainted with our language. Persons desirous of studying German may frequently meet with a teacher; and skilful instructors on the guitar and the machête may be easily found.

The *Post Office* is in the Rua do Estudo, not far from the residence of the British consul. Letters *from* England, sent by the mail steamers of the 9th or the 24th of the month, must have 1s. 10d. paid upon them in England; those sent by the sailing vessels require a prepayment of

8d. only. On the landing of the mail bags they are taken to the British consulate, and after the newspapers have been taken out, they are handed to the officials at the Portuguese post-office, who do not usually deliver the letters at the doors of the persons to whom they are addressed, it being the common practice for visitors to send a messenger to the office on the arrival of a mail. For the trouble of handing a letter over a counter, the sum of 8d. is exacted, whatever may have been the sum paid in England. A single letter sent by a mail steamer costs altogether half-a-crown; one forwarded by a sailing vessel 1s. 4d. Newspapers bearing the newspaper stamp are brought free to Madeira, if a penny postage stamp is affixed to them. On their arrival in Madeira they are obtainable at the consul's. Letters *to* England require no payment in Madeira; they are sent to the consul's, where the bag is made up. On delivery in England, 1s. 10d. is charged upon a letter sent by mail steamer, and 8d. on one forwarded by sailing vessel. The rates of postage above mentioned apply only to letters not exceeding half an ounce in weight. A stamp of 25 *reis* franks a single letter to Portugal when sent by a Portuguese vessel.

Amusements.—At Funchal there are no theatres, picture galleries, or museums; the town is a small place, and the accessible part of the country soon

visited; where, then, is the visitor to find amusement during the months of his sojourn? In truth, unless he has resources of his own, he is likely to be devoured with *ennui* long before the time for his leaving the island comes round. Some private balls, one or two public balls, a few picnics, perhaps a concert, or some amateur acting, this is all that strangers are likely to meet with in the shape of amusements. So much has been said in our second chapter as to the caution with which invalids should enter into these amusements, that further warning needs not to be given here.

Return to England.—The Brazil mail steamer usually touches at Funchal on her homeward voyage about the 5th of the month; the African mail steamer has hitherto been so irregular that no date could be given for her appearance. Both these vessels, on reaching Madeira, are usually so full of passengers that persons at Funchal have little chance of obtaining accommodation unless by prevailing on some of the officers to give up their berths. The brig packets afford the most comfortable passage homeward, and their times of sailing are made to accommodate the greatest number of persons who secure berths in them. The homeward voyage is usually two or three days longer than the outward voyage, in consequence of the northerly winds and calms which prevail at this season. The Galgo sails two or three times in

the spring, with full berths, for Lisbon, the passage money being 25 dollars (£5 : 4 : 2); and there are other opportunities of reaching some part of the continent, for instance, the Havre and Brazil steamers. Occasionally, either one of the English sailing packets, or the Galgo, makes a special voyage to Cadiz, if a certain number of passengers offer themselves.

On leaving the island it is necessary to obtain a passport, no matter what may be the traveller's destination. This document is issued at the governor's office above the Alfandega. It may also be obtained through the British consul, in which case an additional fee of a dollar is paid. The *visé* of the Spanish consul is required when the traveller intends to land in Spain, for which a charge of a dollar (4s. 2d.) is exacted.

A gratuity of 50 rs. (=2½d.) per package is usually paid at the beach to the officer who superintends the embarkation of the luggage. This obviates the trouble of obtaining a permit for that purpose, and the annoyance of any search.

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Coast View, from Heights above the Fossil-bed.

CHAPTER IV.

PHYSICAL GEOGRAPHY—BAY OF FUNCHAL—PICO RUIVO.

> Thus having passed all perill I have come
> Within the compasse of this island's space;
> The which doth seeme unto my simple doome,
> The only pleasant and delightfull place
> That ever trodden was of footing's trace.
>
> *The Faerie Queene.*

THE island of Madeira lies between the parallels of 32° 49′ 44″ and 32° 37′ 18″ N. latitude, and between the longitude of 16° 39′ 30″ and 17° 16′ 38″ W. of Greenwich. It is consequently nearly 10° N. of the tropic of Cancer, and three or four degrees beyond the winter limits of the N. E. trade winds. In summer these trade winds make themselves felt near the coast of Portugal. The island lies in the track of a gentle oceanic current, formed by a branch of the Gulf Stream, which, after diverging from the northern branch, makes a bend and takes a southerly course. Being favoured by the trade wind this current is very plainly apparent in lat. 30° N. The extreme length of the island from Ponta Furada to Ponta do Pargo is 30 geographical miles, its extreme breadth from Ponta da Cruz

to Ponta de Saõ Jorge is 12½ miles, and its circumference may be stated at 72 geographical miles, measuring from one projecting point to another, without following the indentations of the shore, which indeed are not great. The general shape of the island will be best ascertained by a reference to the map. From the dimensions already given, it is clear that its length much exceeds its breadth, and it may be added that its longer axis lies nearly east and west. So great are the inequalities of the surface that it would be very difficult to estimate the superficial contents of the island with any certainty of approach to accuracy, though they are usually reckoned to be about 240 square miles.* When Columbus was asked by Queen Isabella to give her some notion of the configuration of Jamaica, it is said that he took up a sheet of paper, and after crushing it in his hand, partly opened it out; then placing it on the table, he told her Majesty that she would derive a better idea of the island from the crumpled paper than from any description conveyed in words. The same rough model would serve very well for Madeira, the physical geography of which is composed like Jamaica, of hill and hollow in endless

* The area of Madeira is a little less than that of the Isle of Man (which contains about 280 square miles), whilst the population of Man is about one-half that of Madeira. The area of the Isle of Wight is about 186 square miles; it is therefore about one-fourth less than Madeira.

iteration. An elevated ridge, having a mean height of 4000 feet, forms the backbone of the island, up to which, ravines of great depth penetrate from both coasts; and these ravines are separated from each other by narrow lateral spurs which terminate at the shore in lofty headlands. The island may be described as a single mountain rising abruptly from the Atlantic with several peaks of nearly equal altitude at its centre, the highest, Pico Ruivo, overtopping some of its neighbours only by a very few feet. The coast is rugged, and consists for the most part of frowning cliffs composed of dark basalt, sometimes attaining to a great height, as at Cabo Giraõ, which Professor Airy ascertained to be 1920 feet high.* From every point of view Madeira presents a singularly wild and broken appearance, seamed with ravines, embossed with prominences, the highest peaks for months together enveloped in clouds; whilst a line of foam at the base of the whole mass winds in and out with the sinuosities

* Professor Airy informs the editor that his observations were made with an excellent syphon barometer by Simms; and that the circumstances of temperature, steadiness of pressure, etc., were exceedingly favourable. The lower station was at C. dos Lobos, where the barometer was mounted in the arcade of the market-place near the beach, and where its height above the sea was measured. The upper stations were the little hill with trees above the Cabo and the edge of the cliff. The barometer was first observed at C. dos Lobos; then at the upper stations, and lastly, at C. dos Lobos again. The results for the height above the beach were:—Edge of the cliff, 1920 feet; hill above the cliff, 2168 feet.

of the shore. At intervals, the wall of rock which defends the island from the assaults of the ocean, is broken away, and here a stream, whose diminutive size is in striking contrast with the ravine through which it runs, pours an insignificant contribution into the Atlantic, except at those times when heavy downfalls of rain swell its waters to a powerful torrent, which rushes onwards loaded with stones and earth to discolour the sea for miles and miles. It is in the ravines, in the neighbourhood of streams, and not far from the sea, that the villages nestle; and hereabouts are those patches of green which look so enchanting to passing vessels. The northern coast has a bolder mien than the southern. There the cliffs are higher, the cultivation less formal, the trees more numerous, and the whole aspect more stern and grand. There we may behold some of the finest coast scenery in the world; and if the voyager should have the good fortune of beholding it on a clear day from the deck of a vessel four or five miles from shore, he will not easily forget the magnificence of the prospect. Taking a general view of the south side, it must be admitted that the absence of wood is at once remarked, and that the terraces and walls by which the plots of cultivated soil are supported, are too numerous and too palpable, to please the eye. Cultivation has stripped the slopes of much of their beauty, without giving back any equivalent charm.

It is true that on a nearer approach we find the vegetation impressed with a singularly tropical character; still it is not of a kind that gives an air of richness or picturesqueness to the general landscape when beheld from a distance.

Vessels approaching the island from the north usually round Point S. Lourenço,* and run in between the Desertas and Madeira. At the eastern extremity of the island will be seen a long and low neck terminating in rude and utterly bare rocks with an outline of strange unevenness. Huge blocks here and there stand aloof from the main island, sometimes undermined into caverns, sometimes perforated into arches. It was in this locality that the steam-ship Forerunner was wrecked, by the criminal carelessness of her captain, in October 1854. Proceeding, Cabo Garajaõ, or Brazen Head as the English term it (a projecting mass of tufa with a boss of basalt), is passed, and then the city of Funchal comes into view, lying at the bottom of a shallow bay, and backed by a noble amphitheatre of mountains. In order to reach the anchorage, which though the only roadstead of the island, is not very secure, sailing vessels usually keep well out from the land after clearing C. Garajaõ (unless the wind blows strongly from the east), so as to catch the westerly sea breeze, or *embate* as it is

* This point received from Zargo the name of the vessel which first carried him to the island.

here called, which prevails nearly nine months in the year, and is supposed to be the effect of an eddy caused by the hills when the wind outside is from the north or north-east. The roadstead is exposed to winds from all the points from east to south-west. During the storms of winter the sea rolls into the bay with great violence, and a vessel parting its cable, or dragging its anchor in a southerly gale, has little chance of escape. In October 1842, as many as five vessels were driven on shore in the course of a few hours; and one was believed to have gone down at her anchorage, for nothing of her was seen after that fearful gale except a few floating spars. This storm occurred during the night, yet not one person on board of the five vessels was lost. In December 1848 there blew another gale from the south. Five vessels were cast on shore in rapid succession, and were there beaten to pieces, though only one man was lost, and he failed in saving himself, by reason of his solicitude to render aid to his comrades. The British corvette Daphne, nearly shared the fate of the other vessels, but she succeeded in riding out the gale. A crowd of anxious spectators on the beach watched the course of each vessel as it broke away from her anchorage, and was irresistibly impelled towards the shore. At length came the turn of a large barque; the gun from the Loo rock fired once more; the vessel drifted helplessly landward;

Pontinha, and Bay of Funchal from the West.

and the anxiety of the beholders had nearly reached its acme, when the wind suddenly veered a point, and the crew taking advantage of the vacillation of their enemy, steered her out into the open ocean, whilst the lookers-on sent some hearty cheers after her. In order to lessen the chance of being caught by a storm from the south, sailing vessels usually cast anchor about a quarter of a mile N.N.E. by compass from the Loo rock, where there is pretty good holding-ground at a depth of from twenty-five to thirty fathoms. In this position they are clear of the Points, and are generally able to slip their cables and put to sea before the force of the gale sets in. Steamers, being better able to contend against the elements, usually anchor much nearer shore, where they have greater facilities for landing passengers and taking in coal.

Before disembarking let us cast our eyes over the scene visible from the bosom of the bay. Lying at the very base of the hills, and having a southern aspect, the city stretches itself along the margin of the bay, resting each extremity on a shoulder supported by a cliff. Here and there is a spire or a tower, but on the whole the public buildings are few and inconspicuous. The atmosphere around them, however, is clear and smokeless, and the houses, rising as they recede from the shore, are brilliantly white. Many of them run up to a great height above their bases, to afford

the merchants a look-out over the bay. The governor's residence is a large but plain structure, seen across one of the public walks. Of the forts, the largest occupies a commanding position on a height behind the city, overlooking the convent of Santa Clara; another is perched on a black insulated rock that stands bristling with cannon and flag-staves a gun-shot from the land; and a third crowns the Pontinha, a rocky point that stretches from the land near the Loo rock. In this neighbourhood a grove of cypresses near the edge of the cliff indicates one of the cemeteries of the Portuguese. A tall column on the beach,* the substantial Custom-house, another public walk planted with trees, and the fort of Sant Iago, stand out from the front line of houses; whilst further to the east the new Lazaretto is seen at the mouth of a gorge. Numerous neat houses in terraced gardens, or upon points of rock dot the surrounding slopes; and at the upper limit of the inhabited district, 1900 feet above the sea, the eye is caught by an edifice with a domed tower at each side. This is the church of our Lady of the Mountain, where an image is lodged which is the object of many a

* This column was erected by an English merchant named Banger, with the view of its being employed in the unloading of boats, for which purpose, however, it proved to be useless. It was commenced in 1796, and completed in 1798, at a cost of upwards of £1350. It is said that at the period of its erection the sea washed its base, and that the intervening beach has been gradually thrown up in the meantime.

devout pilgrimage on the part of the pious below, for it has the credit, especially amongst mariners, of having wrought divers miraculous deeds. The mountains above rise, bare and rocky, to the height of between 3000 and 4000 feet, a belt of chestnut trees and a few plantations of pine alone breaking the barrenness of the acclivities, and these by the illusion of distance appear only like patches of brushwood. Numerous ridges indicate the course of ancient lava streams, whilst deep ravines cut their way into the heart of the hills and expose their precipitous sides to the day. Bringing our eyes down again to the shore we perceive how shallow is the indentation to which the name of bay is given. Between Brazen Head and Cruz Point, its two extremities, about five miles and a half apart, the line of coast forms an easy curve inwards to the depth of about three quarters of a mile. The cliffs, especially those on the east, are high and of a sombre colour. They look sternly down upon the ocean, and seem to throw glances of defiance on the waves as they rush to their feet and strive to undermine them.

Funchal, the chief town of Madeira, is situate in lat. 32° 37′ 45″ north, and long. 16° 55′ 20″ west from Greenwich.* Consequently noon at Funchal occurs 1h. 7m. 41s. after noon at Greenwich. It is distant by ship's course about 1332

* Major Azevedo's observations.

geographical miles from Southampton, 1164 miles from the Lizard Point, 535 miles from Lisbon, 625 miles from Gibraltar 308 miles, from the coast of Africa, and 260 miles from Santa Cruz in Teneriffe. The mean rise and fall of the tide at Madeira is seven feet; the variation of the compass in 1843 was 21° west.

Pico Ruivo (the Rothhorn, Pico Rosso, Puy Rouge, or Red Pike of Madeira) is generally considered the highest point in the island. The neighbouring Torres (de Poizo) are however very little if at all inferior, but being inaccessible, barometrical observations are not possible. Pico Ruivo rises from the main central ridge not far from the middle of the island. From the apex of this "spicular mount," we look down into three great ravines, the Curral, Ribeiro de S. Jorge, and Ribeiro Secco; whilst over the towering summits of a hundred peaks, the ocean stretches away on every side. There is a basaltic dike at the top, and streams of lava are seen adhering to the steep flanks of the cone. According to the most careful measurements Pico Ruivo has an altitude of about 6100 feet, but the following table will shew what different results have been obtained by observers:—

1811. Gourlay	8250	feet.
Encyclopædia Londinensis	5068.5	,,
Smith, Irish Trans. vol. 8.....	5162	,,

1821. Clavering and Sabine, Journal of Science, No. 29...	5438	feet	Barometer.	
1823. Bowdich.....	6087	„	„	
„	6303	„	Trigonometry.	
Friends of Bowdich	6118	„	Barometer.	
1826. Dr. Heineken, Phil. Mag. 1837.....	6069	„	„	
1838. Officers of U.S. Exploring Expedition under Capt. Wilkes	6237	„	„	
1839. Officers of H.M.S. Erebus & Terror	6097.08	„	„	By Gay Lussac's formula for expansion of air.
	6102.9	„	„	By Rudberg's formula.
1844. Captain Vidal of H.M.S. Styx.....	6056	„	„	

The slope from the summit of Pico Ruivo to the nearest part of the northern shore is about 1 in 3.75; that to Funchal is rather less than 1 in 6. The slope from the top of Mount Blanc to the valley of Chamouni is 1 in 2.1; from the top of the Peak of Teneriffe to its base, 1 in 4.6; from the top of Vesuvius to its base, 1 in 4.4; and from the top of Etna to its base 1 in 5.6. Comparing the heights with the circumferences of their bases, we find the proportions to be—Peak of Teneriffe, 1 to 28; Etna, 1 to 34; Vesuvius, 1 to 55; Pico Ruivo, 1 to 66.

The height in feet of the loftiest points of the chief volcanic islands and island groups of the Atlantic, is here given for comparison with the height of Pico Ruivo. The date of the last eruption is placed between brackets. Peak of Tene-

riffe (1798), 12,182; Fogo, Cape Verdes (1847), 9154; Tristan d'Acunha, 8236; Pico, Azores (1720), 7808; Green Mountain, Ascension, 2870; Diana's Peak, St. Helena, 2700.

Pico Ruivo is about twice the height of Helvellyn (3055 feet); rather higher than Vesuvius (5731 feet), and the Rigi (5905 feet); not quite so high as Mount Olympus (6332 feet); about half the height of the Peak of Teneriffe; whilst Mount Everest in the Himalayas, the highest mountain in the world, is more than $4\frac{3}{4}$ times as high.

That a person standing on the summit of the Peak of Teneriffe should be able to make out Pico Ruivo, it would be requisite that the latter mountain should be three times higher than it actually is; or that each mountain should have an altitude of 15,000 feet. The distance from one mountain to the other is about 260 geographical miles. When Dr. J. D. Hooker was travelling in the Himalayas, he saw Chumulari at a distance of 210 miles, which he thinks is probably the utmost limit at which the human eye has ever discerned a terrestrial object.

The height of the snow line in the latitude of Madeira is probably about 11,500 feet, in that of Teneriffe, about 12,500; consequently neither Pico Ruivo nor the Peak of Teneriffe reach that line, though the latter approaches very near it.

CHAPTER V.

HISTORY OF MADEIRA.

Named from her woods, with fragrant bowers adorned,
From fair Madeira's purple coast we turned:
Cyprus and Paphos' vales the smiling Loves
Might leave with joy for fair Madeira's groves;
A shore so flowery and so sweet an air,
Venus might build her dearest temple there.—

Mickle's Lusiad.

It is not impossible that the early Phœnicians fell in with the Madeira Islands during some of their adventurous voyages, by which they sought to enlarge their knowledge of the great deep, and its limiting shores; but the evidence adduced to support the conjecture that they actually visited these islands is clearly insufficient for the purpose. Pliny tells us of King Juba's geographical investigations, and mentions certain Purple or Mauritanian Islands, the position whereof, with reference to the Fortunate Islands, which appear to be plainly enough identified with the Canaries, seems to point out the Madeiras as those intended. It was here

that the king contemplated an establishment for extracting the dye termed Gœtulian purple, but whether animal or vegetable matter was to supply the colour is not manifest. Ptolemy speaks of an island in this part of the Atlantic ocean, under the name of Erythia, which may be translated Red Island, and it has been thought that reference was here again made to the fact of purple dye being obtained there. Then, for hundreds of years, these islands have no place in history.

There is a tradition, which has been made the foundation of scores of poems and romances, and which every historian of the island feels bound to mention, even whilst he expresses his want of belief in its truth, touching two lovers, Robert Machim and Anna d'Arfet, who preferred, like Lord Ullin's daughter and her lover, to meet the stormy elements rather than an angry father. In attempting to cross from Bristol to France in 1346 they were driven by a violent storm to Madeira, where they were cast on shore at the place subsequently called Machico, in memory of the occurrence.

In that brilliant period of their history to which the Portuguese justly refer with pride, Prince Enrique, *o Conquistador*, son of Dom Joaõ I., sent an expedition under Joaõ Gonsalvo da Camara, nicknamed Zargo (or squint-eyed), to examine a part of the African coast. The vessels were caught

by a storm, and were driven in 1418 to Porto Santo (so named in gratitude for their rescue from the perils of the deep), where he left some of his crew, and then returned to Portugal. The next year two small vessels were fitted out with the intention of conveying colonists to the newly discovered island. On his arrival, Zargo was informed by those whom he had left there, that in one particular direction there hung perpetually over the sea a thick impenetrable darkness, which was guarded by a strange noise that occasionally made itself heard at Porto Santo. By some the place was deemed an abyss, from which whoso ventured thither could never return; by others it was called the Mouth of Hell. Certain persons declared it to be that ancient island Cipango, kept by Providence under a mysterious veil, where resided the Spanish and Portuguese Christians who had escaped from the slavery of the Moors and Saracens. It was considered, however, a great crime to dive into the secret, since it had not yet pleased God to signify his intention to reveal it by any of those signs which were mentioned by the ancient prophets who spoke of this marvel.* Notwithstanding

* The most probable solution of this thick impenetrable darkness, if it were anything more than pure fiction, is that it was the effect of mists and exhalations, constantly steaming up from a dense vegetation, and of a corresponding deposit in the shape of rain clouds. Columbus remarked, 350 years ago, that the quantity of rain in Madeira, the Canaries, and the Azores, was formerly as

these alarming tales, Zargo resolved to penetrate into the wonder, and setting sail he arrived in due time at Madeira, which he took at first to be part of the mainland of Africa. Here he found a vast quantity of wood, and a few birds. Proceeding along the coast he gave to certain localities the names which they still retain; thus, Santa Cruz (where a cross was erected), Funchal (the place of Fennel, much of that plant growing there),* Praya Formosa (beautiful shore), Ribeiro dos Socorridos (river of the assisted), a place where two of the company attempting to cross the stream lost their footing, and had been swept into the sea, if some of the rest had not saved them. At one place he was startled by seeing some seals issue from a cave and leap into the sea, which spot he named Camara dos Lobos (Wolves' Lair). After an examination of the island, Zargo returned to his ship, which he loaded with specimens of the wood, water, birds, and plants; and then set forth to Lisbon, where he arrived, as the old narrator point-

great as in Jamaica, but rain had become much more rare since the trees which shaded the ground had been cut down. A similar change has probably taken place at Jamaica, for the annual fall of rain there is now only about 49 inches, whereas in other islands of the West Indies it exceeds 100 inches.

* It is well known that the Spaniards and the Portuguese, though near neighbours, are not on the best of terms. This will explain why a Spaniard, on being informed of the derivation of the word Funchal, muttered the proverb—

Donde creve la escola
Nace el asno que la roya.

edly remarks, without losing a man on the voyage! The King and Prince were greatly pleased with the discovery, and sent Zargo and Tristaõ Teixeira, the following year, to take possession of the island in behalf of the Crown of Portugal. Landing at Machico, Teixeira built a church, in compliance, it is said, with the last request of Machim, whose tomb was still recognisable; using, in its construction, the very tree which sheltered the altar at whose foot the pair lay interred. Zargo then founded the city of Funchal, and built the Church of Nossa Senhora do Calhaõ. The island, being uninhabited, fell quietly into the hands of the new comers; and humanity is not here shocked with tales of butcheries and savage deeds, committed under specious pretences, such as we read of when the Spaniards invaded the Canaries. Zargo and Teixeira divided the island into two *comarcas*, each taking command of one, with the titles of *Capitaõ* and *Donatorio* (captain and grantee), and they then portioned out the land amongst their followers, many of whose descendants retain to this day some of the property thus acquired. The captains had a grant from the Crown of absolute jurisdiction within the island, appeal to the monarch being only permitted in cases of life and death. Zargo lived to enjoy his command for forty seven years, and when he died, he was interred in the Convento of Santa Clara. The

daughter of Perestrello, one of those who first landed at Porto Santo, and who was subsequently appointed governor of that island, became the wife of Christopher Columbus, who resided there for some time, and occasionally made visits to Madeira. When his wife's father died he became possessed of various charts and memoranda relating to voyages in the Atlantic, which strengthened in him the feeling that there was a continent to be discovered beyond the western waves. In 1508 Funchal was made a city. Six years later a bishopric was created here, which, in 1539, by a bull of Pope Paul III., was converted into an archbishopric. In 1547, however, when an archbishopric was established at Goa, the diocesan of Funchal became a bishop again. In October 1566 it was attacked by a little army of marauders, which sacked the place and checked its growing prosperity. The story runs that eight French galleons suddenly made their appearance, landed a thousand men, who marched on the city, the inhabitants of which made so feeble resistance that the French became its masters in a very short time. The Portuguese lost about 200 men, the French fifty. The invaders, who are said to have been Huguenots (a statement which is perhaps nothing more than a Roman Catholic legend), remained sixteen days, during which the churches were plundered, the images burned or broken, the altars destroyed, and the

holy relics profaned. When they entered the church of Saõ Francisco, all the friars, except nine, fled to their cells, and those nine were seized and slaughtered. One, moreover, died in an agony of terror. A vessel was immediately dispatched from Machico to Lisbon to request assistance, but when the fleet conveying the succouring troops arrived, the French were no longer there, having departed six days previously, carrying with them all the valuables they could lay hands on.

In 1580 Madeira fell, with the mother country, under the rule of Spain, and so continued until 1640, when Portugal threw off the Spanish yoke. The only alteration made under the new dominion was the abolition of the administrative functions of the captains, and the appointment of a governor as the supreme authority, which system continued to be adopted after the Portuguese rule was restored.

In 1768 Captain Cook, who was then setting out in the Endeavour on his voyage round the world, battered the fort on the Loo Rock, in conjunction with a frigate, by way of resenting an affront which had been offered to the British flag. This incident is not mentioned in Hawkesworth's account of the voyage, having been suppressed by command of the Government, but it was made public by Forster.

The minister Pombal having become alarmed with the number of slaves existing in Portugal,

issued a decree in 1773 for the abolition of slavery; and this decree was published in April 1775, at Funchal, where the coloured people were also numerous. According to the chronicler Fructuoso, there were 2700 slaves in Madeira in 1552. They consisted of the descendants of the conquered Moors of Portugal, Moorish captives carried off from Africa, and a few negroes. Very few negroes are now to be seen in Madeira, though the features and hue of a good many of the lower classes tell of an African origin.

In 1801 the British government, as the allies of Portugal, sent a garrison under Colonel Clinton to occupy the island; but the conclusion of the peace of Amiens in the course of a few months rendered such armed occupation no longer necessary. War having again broken out between England and France, forcible possession of the island was taken by the British in 1807, when Admiral Hood commanded a fleet which conveyed thither General Beresford and 4000 troops. We have seen the original signatures of the principal inhabitants attached to an oath taken on this occasion, by which they individually and collectively swore "to bear true allegiance and fealty to His Majesty King George III., and to his heirs and successors as long as the island should be held by his said Majesty or his heirs, in conformity to the terms of the capitulation made and signed on the 26th of December 1807, whereby the

island and its dependencies were delivered over to his said Majesty." The island, however, was restored to Portugal in the following April, although it continued to be garrisoned by British troops, with the view of protecting it against the French, but at the general peace of 1814 the place was evacuated. The troops were quartered during this period in the barracks at the Collegio, at the Encarnaçaõ Convent (the nuns being transferred to the Convent of Santa Clara) the monastery of Saõ Francisco, and the fortress of Sant 'Iago.

In 1826 came the Miguelite troubles, when Portugal was divided against herself, at which time many deeds of cruelty and bloodshed were perpetrated. Madeira did not escape; civil war raged there also, and the memory of many persons still living, turns with a shudder to the horrors of that time. However, Dona Maria's authority was at length established. Upon her untimely death in 1853 her husband Dom Ferdinand assumed the regency, until the non-age of his son Dom Pedro V. had expired, whose accession was celebrated at Funchal with due solemnity and festivity in September 1855.—*Vivat Rex!*

CHAPTER VI.

INHABITANTS—MANNERS AND CUSTOMS—OCCUPATIONS—TRADE—MANUFACTURES—IMPORTS AND EXPORTS.

THE inhabitants of Madeira are of Portuguese descent, and are not distinguishable from their relatives in Portugal save by a certain amount of provincialism in their speech, and a somewhat darker tinge on the skin of the lower classes, speaking of an intermixture of African blood. The men are well formed, athletic, and usually of the middle stature. The women have seldom any claim to personal beauty; their dark hair and eyes are their redeeming features. If of the better class, their inert, sedentary life induces early corpulence; if belonging to the lower order, the severe labours and nipping poverty of their lot make them look much older than they really are. Arriving early at maturity, they are soon past the prime of any comeliness they may possess. The women of the country, however, are less plain than their sisters of the city, and handsome features and

fine figures are not unfrequently seen amongst them.

Respectful without servility towards their superiors, and invariably polite towards each other, they seem to possess, as a gift of nature, the essence of good manners. Even the children have an ease in their behaviour which is in striking contrast with the awkward bashfulness of English children of the same age and class. The peasants have their set complimentary phrases on meeting and taking leave of their superiors. *Nosso Senhor, dê muitos bons dias a V^a. S^a.*—"May God grant your Lordship many good days!" *O Senhor passa muito bem até outra dia, se Deos quizer.*—"May you continue in good health until we meet again, if God will!" When servants bring lights into the room at night, they wish one *boa tarde* (good evening); just as in Italy, on similar occasions, they offer their wishes for a *felice sera.* If you sneeze suddenly the Madeira peasant exclaims *credo!* by way of protection against the Evil One, or he mutters his prayer for your welfare, compressed into a single word, as the Italian peasant ejaculates his "*prosit*" on a like occurrence.

The dress of the peasantry is peculiar, though it can scarcely be called picturesque. The women usually wear a garment of printed calico, or striped linsey-woolsey petticoat of island manufacture, with a cape of red or blue baize and common buff

boots, unlike, in this respect, the women at the Azores, who are very gay about the feet. The ordinary attire of the men consists of a short linen jacket, a pair of loose linen trousers, terminating at the knee, boots of buff leather (one of which as they tramp along the roads is frequently carried in the hand), and a shirt, fastened at the neck with ornamental studs; a stout pole, the alpenstock of Madeira, is borne in one hand. Sometimes a coarse woollen cloak hangs from their shoulders, but its folds are not so ample as that in which the Spaniard wraps himself. As a covering for the head, both sexes have a curiously shaped cap of blue cloth lined with red, called *carapuça*, which may be likened to an inverted funnel, the cup-shaped portion being small, and the pipe-like part long and slender. This cap affords so little protection to the head, that it is strange how it came into use. It appears not to have been worn when Forster visited the island in 1772. An article of somewhat similar shape is seen on the heads of the ladies in the pictures of Rubens, only the tapering tail there terminates in a tassel. The peasantry of St. Michaels, Azores, also wear a *carapuça*, but its form is very different from that worn by the Madeira peasant. Modern bonnets, however, have superseded the *carapuça* in Funchal; or a kerchief is passed over the head and pinned under the chin—a mode that reminds us

of Mrs. Ford's demure declaration to the gallant Falstaff,—"A plain kerchief, Sir John; my brows become nothing else, nor that well neither." On certain special days the Funchal ladies lay aside their bonnets for the *veo preto*, a black veil which falls from the head over the face, in the fashion of the Spanish mantilla. In the city, the middle part of the persons of the men is enveloped in a gaudily-coloured waistcoat, and a jacket of blue cloth is thrown over one shoulder.

The better orders dress pretty much as they do in England. In the attire of the ladies as well as in the decoration of the houses, a love of decided colours is apparent, and these are seldom harmoniously arranged.

Whilst the lower classes of Madeira are sober, good-tempered, and cheerful notwithstanding the privations of their lot, they are grossly superstitious and ignorant. They universally believe in the efficacy of charms and vows; but have the most enlightened nations much reason to pride themselves on an exception from such misbelief, if they look at the lowest strata of society? In the performance of their vows men may sometimes be seen carrying heavy chains or bars of iron; whilst women climb on their bare knees over sharp stones, and up hard steps to the door of the Mount Church. The prejudices of the same classes are strongly opposed to every kind of innovation, or what other nations

call improvements, in their ways of life or labour. With a strong spice of litigiousness in their disposition, acts of violence seldom occur, and the more heinous crimes are very rarely committed. Petty thefts, however, are common; and strict integrity is nearly unknown.

Those who have inquired into the subject of religion report that the standard is low, and that the priests are careless, indifferent, and devoid of energy. The morals of a considerable section of the priesthood are lax, and there is evidence about the dwellings of many of them that they are no more rigid observers of their vows than the Lamas of Sikkim.

There can be no doubt that the island is greatly overpopulated, having regard to its limited resources, and the scanty available capital. One would, therefore, say that it was the policy of the government to encourage emigration; but this is not the policy they have acted on, for by imposing a heavy passport duty they have endeavoured to prevent persons from leaving the scene of their destitution. The consequence has been, that a very large number of persons have removed themselves clandestinely, and by these means the population has been decreasing for some years past. (See the note to the population table, Appendix A.)

The nature of the country interposes serious

impediments in the way of intercourse between the inhabitants of different districts, and many of the grown-up peasants have never left the ravine in which they were born. The first visit to Funchal is attended with so much bewildering excitement, in those whose good fortune enables them to make the excursion, that it forms an epoch in their lives never to be forgotten.

The life of the labouring man is compounded of hard work and idleness. His sustenance is generally scanty in quantity, and ill adapted in point of quality to fit him for prolonged or severe toil. Like an Irishman, he is cheerful amidst rags filth, and want, and is moreover inordinately talkative; he wants the power to apply himself steadily to work, and when his master's eye is not upon him, he indulges his natural taste for indolence and loquacity. In the country, little money passes as payment for labour, a good deal of work being done in return for other work. The wages of a labourer are from two bits to two bits and a half without food, or a bit less, with food. Near Funchal wages are a little higher. The great ambition of those who live near the city is to enter the domestic service of the English, and when they succeed they can manage to earn as much in six or seven months as will keep them the whole year. The wages of skilled artisans at Funchal range from five to eight testõens per diem.

The principal part of their sustenance is derived from the *inhame*, common potato, sweet potato, cabbage, pumpkin, lupine, kidney bean, Indian corn meal made into porridge, chestnuts, and fish, which is plentifully taken during the favourable weather on the south coast. Much salt fish, chiefly cod and herring, is imported.*

In consequence of the rugged nature of the country, boats are employed as much as possible in the conveyance of goods from place to place; but a good deal of carrying is necessarily effected on men's shoulders. The weight that one of these fellows will bear is quite astonishing when the steepness of the paths he has to traverse and the length of the journey are considered. A load of 250 lbs. is not uncommon, and sometimes a man will be found with a burden of 300 lbs.

Like other places, Madeira has been occasionally visited by pestilence and famine. In the summer of 1856, cholera broke out and swept away about seven thousand persons in the course of a few weeks. In many districts, society was completely disorganised on the appearance of the scourge; and the

* In 1853, the boats employed in fishing at Madeira amounted to 93 and the persons to 475; in 1855, 117 boats and 578 persons were employed. The Appendix contains a list of the principal fish brought to market. Any surplus supply of fish is salted for consumption on the island; and sometimes when the take of herring has been considerable, it has been cured for exportation.

Government had to install a new body of officials in place of those who had died or had fled. In the autumn of 1852, in consequence of the first failure of the vine crop, and the extensive disease in the potato crop, the people had famine staring them in the face; and if it had not been for the active measures adopted by the foreign merchants resident at Funchal, a large portion of the population must have died. As it was, the deaths from this cause were very numerous. A committee, consisting principally of foreign merchants, was appointed by the Portuguese Government to receive and distribute amongst the distressed classes such contributions as might be sent from foreign parts. This committee, at the close of their labours, reported that contributions in food or money to the amount of 38,199 *mil-reis* (£8895) had been received, nearly two thirds of which came from the United States of America, and rather more than a fourth from Great Britain. A large part of the money fund was expended in affording labour to the poor, about 9000 mil-reis having been laid out on the new road.

The inhabitants of Madeira are passionately fond of music. The instruments in common use are the *machête*, the Spanish guitar (*viola Françesa*), the *guitarra*, or old English guitar, with six double wires, and the violin (*rebeca*).* The *machête*

* *Rebeca:* this is connected with an antiquated English word, *rebeck*, to be met with in our old dramas. In Romeo and Juliet,

is peculiar to the island; it is a small guitar, with four catgut strings, which are tuned in thirds, with the exception of the lower two, which have an interval of a fourth. This instrument is used by the peasantry to accompany the voice and the dance. The common music consists of a succession of simple chords; but, in the hands of an accomplished player, the *machête* is capable of much more pleasing harmony; and the stranger is sometimes agreeably surprised to hear the fashionable music of our ball-rooms given with considerable effect, on what appears a very insignificant instrument. One or two peasants may frequently be seen in country places beguiling the fatigues of their journey by performances on their favourite instrument. The strains soon gather a band of casual wayfarers, who fall into line and walk in step to the music.

The Portuguese have many pretty vocal melodies (*modinhas*), but the kind of singing in vogue among the peasantry of Madeira scarcely deserves the name of music. To an English ear it resembles a prolonged howl. The singer commences at the top of his voice, holds on his high note as long as he can with one breath, and only descends to

Shakespeare has bestowed the name of Hugh Rebeck on a musician. The couplet in L'Allegro will occur to every reader:—

When the merry bells ring round,
And the jocund rebecks sound.

the bottom of the scale when the lungs are exhausted. Yet there is something peculiarly exciting in this kind of singing to the peasants themselves, especially when making their way in gangs across the mountains. Frequently one of a party opens a musical conversation by challenging another, who in due course howls his response. This is kept up for hours amidst bursts of laughter from the rest; and thus the fatigues of all the company are lightened.

As to the upper classes, their manners are somewhat ceremonious, but uniformly courteous. If you call on a Portuguese gentleman, he offers to place his house at your service; if he calls on you, what an amount of genuflection when he departs! A series of profound moves takes place at the door of the room, another at the head of the stairs, and a third at the foot of the stairs, just as Lord Caernarvon has described in the account of his visit to Portugal. Little familiar intercourse exists between the English and the Portuguese, for our nation is seldom chargeable anywhere with too great an intimacy with foreigners. Many of the higher class speak both French and English. The circumstances of the gentry have been gradually becoming worse for many years past, and many of them, in consequence of the loss of the grape, have been brought to poverty. In their days of prosperity, they kept

great state, spent their money bravely, built themselves noble country-houses (now everywhere falling to ruin), and had their little courts of dependents. Ovington, who was here in 1689, tells us how mightily the people affected gravity in their garb; wearing black, he thought, in compliment to the clergy. They could not, however, live without the spado and the dagger, which were even part of the costume of servants waiting at table, "who proudly strut with their dishes in their hands, and a basket-hilt to a sword, at least a yard long, even in the midst of summer."

Light-hearted and witty, the Portuguese delight in lively conversation. They are fond of coining nick-names, and to such an extent is this carried, that the real names of many persons at Funchal are almost forgotten, their *sobriquets* alone being in common use.

With general science or literature, even the better classes are but slightly acquainted. Their own literature is of small extent; and the Portuguese rely for any amusement they may seek in reading almost entirely upon translations from the French, the books being usually the fascinating novels of Paul De Kock, Eugene Sue, and their *confrères*. A private library is a thing unheard of, and there is not a Portuguese bookseller's shop on the island. Some of the shopkeepers, it is true, keep books on their shelves, but they are very few

in number, and are chiefly works of religious devotion. Four weekly newspapers were published at Funchal, until the cholera broke out in 1856; but their circulation was extremely small, and the discussions in their pages were frequently very much in the style of the controversy between Mr. Pott and his rival editor at Eatanswill. The earliest newspaper was the *Patriota Funchalense*, which made its first appearance on the 2d July 1821.

Of the history and laws of the mother country, or of the small island, their birth-place, the natives of Madeira are sadly ignorant; and the amount of their knowledge of foreign countries may be easily conjectured. Exceptions there are, however, to this description; and a few persons may be found who have profited by travelling abroad, and who deplore the ignorance of the mass of their countrymen. The wealthier gentry have been in the habit, of late years, of sending their sons to be educated in France or England; and this measure may reasonably be expected to be beneficial to their less fortunate associates as well as to themselves.

The manufactures of Madeira (if the making of articles on a very small scale may be dignified with this appellation) consist of coarse woollen and cotton goods for island wear, hats, tallow candles, coarse earthenware,* gold and silver work, casks,

* China and the best quality of crockery come from England; middling qualities of earthenware from Lisbon. The shape of the

musical instruments, furniture, marquetry, boots and shoes, baskets, sweet-meats, feather flowers, and ornamental needle-work. Of the last-mentioned article, being good and cheap, large quantities are sent to England. Since the vine disease appeared, the coopers have had little employment, and many of them have emigrated. Their casks were excellently made, and held in much estimation. The price of a pipe was about six dollars. Carving is not practised, but a great many ornamental articles are made from the pretty woods of the island, tables, walking-sticks, boxes, paper-cutters, etc. The tallow candles are superior to those made at Lisbon, and a small quantity of them is sometimes sent to the capital. Horse-hair is worked into neat chains for ladies, and sold about the streets. Small fancy baskets, of a hundred different shapes, are made of the peeled twigs of broom. Stronger baskets for household use, are constructed of willow, and stout serviceable chairs are made of the same material.

The establishment of a bank in Madeira would be of essential service to the island. At present there exists no institution of this kind, and when a man acquires a little surplus-money, it is either hoarded, or invested in stone and mortar. The

porous monkey jug, so useful for cooling water in hot weather, is very ancient, for vessels precisely similar in form have been found amongst Etrurian remains.

lower classes invest their savings in gold ornaments, because these can be again easily converted into money in case of need.

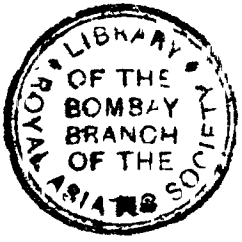
The exports consist chiefly of wine, beef, oranges, lemons, citrons, straw-plait, fancy baskets, needlework, and a few boots and shoes sent to the West Indies and the African coast to the value of £150 per annum.

The total value of the exports from Madeira during 1851, according to the Custom-house returns, amounted to £164,960, of which £96,950 was shipped in British, £26,500 in American, and £16,650 in Portuguese vessels. In 1853, the declared value of exports had decreased to £95,470, of which £63,270 were British, £17,000 American, and £14,600 Portuguese. This falling off may be accounted for by the failure of the vine crops during the preceding year. The total value of the exports in 1855 (exclusive of wine) amounted to about £2400.

The imports of the island are somewhat more extensive, and necessarily of a more varied character. These consist principally of silk, cottons, and woollen manufactures; bar, hoop, and manufactured iron; groceries and provisions from England; staves, timber, oil, and flour, from the United States; grain from the Mediterranean and ports of the Black Sea; sugar, oil, corn, and a variety of other articles from Lisbon and the Portuguese

possessions. The total value of these imports in 1851, according to the returns of the Custom-house, amounted to £177,760 sterling, and in 1853 to £154,650.

In 1855, the chief imports of articles of consumption consisted of 1193 moios of salt, 6424 moios of maize, and 1989 moios of wheat. The salt was all brought from Portugal. Of the maize, 2525 moios came from the Azores; 3360 moios from the African coast, principally from Mazagan. Nearly the whole importation of wheat came from the Azores. The quantities of beans and barley imported were very trifling. Flour to the amount of 6738 arrobas (1930 cwt.), was imported principally from North America. Of fine oil, 1067 lbs.; of sweet oil, 8828 gallons; and of physic-nut oil (used in the street lamps), 7118 gallons entered. Of sugar, 36,176 arrobas (10,336 cwt.) were introduced.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CHAPTER VII.

FUNCHAL—PUBLIC WALKS—RIVERS—INUNDATIONS—FORTS—CHURCHES—CONVENTS—POOR HOUSE—HOSPITALS—MARKETS—OLD BUILDINGS—BEACH—SLEDGES—A STROLL THROUGH THE STREETS.

No place appeared to me more fitted to dissipate melancholy, and restore peace to the perturbed mind than Teneriffe or Madeira.
Alex. von Humboldt.

ALTHOUGH there is nothing especially attractive to the eye of a stranger in the city of Funchal, the general air of neatness and cleanliness that pervade it, the size of some of the houses, and the foreign look of the whole place, render it by no means unprepossessing. The streets are narrow and irregular; they are paved with small pieces of stone which are rounded on level ground, angular on slopes. Side paths for foot passengers are wanting, but as wheel carriages do not exist, and a walking pace for horses is enforced by a pecuniary penalty,* this want is not of much consequence. Some of the streets bear very curious names; thus, there

* A fine of three dollars is imposed on any one riding at a rapid speed in the streets of the town.

are Spider Street, Deaf Man's Lane, Street of the Black Women, and Turkey-cock Street. The principal street, running east and west, is the Carreira, which is a name analogous to Corso, the title of one of the chief streets at Rome. At several fountains scattered throughout the town, excellent water is supplied to the inhabitants. The streets are well drained by covered sewers. The houses, formerly flat roofed in the Spanish fashion, are all now furnished with sloping roofs. The ground floors of the larger houses in the principal streets are generally used as stores or shops. In the former case a multitude of bars suggest the idea of a prison. The windows of the first or second floor are usually furnished with small balconies, which are filled with a gay assemblage on holidays. The entrances of some of the large houses deserve notice from their size, and the amplitude of their double flights of stone stairs ascending from a paved and covered courtyard.

In various parts of the town are open spaces (*praças*) planted with trees, and forming something that answers to the Alamedas of Spain and the Boulevards of France. The Praça da Constituiçaõ, near the Cathedral and Misericordia Hospital, is the favourite place of resort, and here are usually to be found several parties on the shady benches discussing the affairs of the nation, or more frequently the affairs of their neighbours. The

Praça da Rainha is by the shore in front of the governor's palace; the Praça Academica is near the sea in the eastern part of the city.

The city is crossed by three rivers, which in their ordinary state are very small streams winding amongst the stones at the bottom of deep ravines, where washerwomen are usually at work amidst acres of linen spread out upon the rocks to dry in the sun. In this state the necessity of the lofty and substantial stone walls that hem them in is not apparent. Several times in the course of the winter the water becomes turbid, and will be seen to rise for a few hours. At distant intervals, however, something more than this occurs.

Strangers should not suffer themselves to be misled when they hear the Funchalese speak of the Deluge. They do not refer to the Noachian event, but to a calamity which occurred in 1803. Moquet, who visited Madeira in 1601, speaks of the water which sometimes came from the mountains in such abundance as to cause inundations which did much damage, carrying away bridges, houses, churches, and other edifices. One night in October 1803, the water rushed down the Ribeiro de Joaõ Gomez with great violence, and caused a very disastrous flood, of which Bowdich gives the following account:—

"There had been no rain for months, and the rivers or torrents were almost dry. The rain did

not begin before mid-day, continued incessantly, and at 8 o'clock the torrents came down, swept away all the bridges but one (on which the surveyor had built his own house), and carried away several houses, with the inhabitants in them vainly imploring relief from the windows; the lower parts being full of water, it was impossible to force the doors, and before ladders could be applied, the houses went to pieces, and the unfortunate people were lost. One house was carried into the sea, and seen there entire for some minutes with the lights in the upper windows. The total loss of lives must have been upwards of 400. The streets were choked with ruins and heaps of dead oxen, sheep, and domestic animals; the church doors were blockaded with bodies, laid there to be owned, and accumulating as they cleared the streets; some apparently retaining sparks of life, but neglected and allowed to expire in the general panic and bustle. They were all burned afterwards, and all the pitch and tar put in requisition to fumigate the streets by bonfires. It is said to have been scarcely less distressing to view the despondence which for days pervaded almost the whole of the lower classes; they believed it was the end of the world, and would make no exertion, but remained like statues until roused by the renewal of the rain, when they ran from their houses, some rushing through

the crowd with torches, others rolling over each other in the darkness of the night, many returning in despair, unable to find a retreat. The peasantry flocked to Funchal, thinking the calamity had been confined to the country, and met the flying townspeople on their way. One good, however, resulted; for the quantity of earth carried into the sea, diminished the soundings and anchorage of the harbour several fathoms. From the breaking up and transport of large pieces of ground in the interior, it would seem that a water-spout had burst there." It was on this occasion that the Church of N. S. do Calhaõ, the second that Zargo erected, was swept away from its site near the fruit market, at the end of Rua da Santa Maria. The house which was carried into the sea was inhabited by an English family named Tatlock. At that time the rivers were not hemmed in by strong walls when they traverse the city as at present; but even since these protecting walls have been erected, there have been several destructive floods. In October 1842, the water of the same ravine burst its bounds once more, but as this happened in the day time, no lives were lost. One night in January 1856, a loud roaring noise was heard in the same ravine, and when morning broke it was found that a vast quantity of rock, stone, and sand had been brought down by the water, and deposited in the bed of the ribeiro

between the two bridges. The arch of the lower bridge, which had been built after the flood of 1842, was completely choked up with rubbish, and the water rushed into Pelourinho Square, and swept away a considerable part of an old fort standing near the sea. The lower parts of the houses in the neighbourhood were filled with water, which left much sand and mud behind it when it retired. With a view to the rapid and effectual clearing away of the vast detritus which was deposited in the ravine and in the streets, trucks, horses, and iron rails were sent for to Lisbon, and the inhabitants of Madeira were soon astonished with the sight of a few yards of railway actually at work. The rails extended from the sea to the rubbish, and were used to aid the conveyance of the latter from the place of deposit to the beach, horses being employed to draw the trucks.

The governor of the island resides in a large irregular building, known as the *Fortaleza* or the Palace of S. Lourenço, situate between two of the public walks, and overlooking the bay. This edifice was much altered, part being entirely rebuilt, during the occupation of General Beresford in 1808. In one of the saloons is a series of ill-painted portraits, intended to represent the early governors, with Zargo amongst them.

The city is nominally defended by several forts and batteries, eleven in number, most of

which are in a state of ruin. That known as the Peak fort (*Castello do Pico de S. Joaõ*), which occupies a commanding position behind the town, is, however, maintained in good order. It is well worth the while of passing strangers, who can spend only a few hours on the island, to climb to its highest tower, for the sake of the extensive view it commands.

Funchal is divided into four parishes, namely, the Sé, Saõ Pedro, Santa Luzia, and Calhaõ or Santa Maria Maior.

The cathedral church or *Sé* is a large edifice, with a square tower and short spire, the west end of which faces the Praça da Constituicaõ. It was built during the reign of King Emanuel, and opened in 1508, during the captaincy of Simaõ Gonsaloes da Camara surnamed *o Magnifico*, the third in descent from Zargo. Commenced in 1485, completed in 1514, the style a mixture of Italian and Gothic, there is little that can be called remarkable in the structure, except the fretted ceiling of native juniper. With the relieving force that was sent in 1566 from Lisbon to repel the French freebooters, there came the first of the Jesuits, and he was soon followed by other members of that order, who established a college, which they maintained until their expulsion in 1758. They built the church of S. Joaõ Evangelista, now known as the *Igreja do Collegio*, the

principal façade of which is ornamented with statues of St. Ignatius, St. Francis Xavier, and other chiefs of the order. This church and those of Saõ Pedro, and N. S. do Socorro, have much the same internal arrangement and style of ornament. The pictures they contain are valueless in an artistic point of view. The patron saint of the city is St. James the Less (Sant' Iago Minor). The members of the Camara walk in procession once a year to the Socorro Church, for the purpose of returning thanks to this saint, for services which he is believed to have rendered the city by staying an epidemic.

In various parts of the city are small chapels, but none are worthy of notice, except, perhaps, the *Capella das Almas*, picturesquely hollowed out of the solid rock, at the end of a narrow street near Santa Clara. Most of the large houses of the *morgados* contain chapels, where service is occasionally performed, in accordance with the charter founding the entail.

"Murder (says an old writer on Madeira) is here in a kind of reputation, and it is made the characteristic of any gentleman of rank or fashion to have dipped his hands in blood. The chief source of this execrable crime is the protection it receives from their churches, which sort of sanctuaries are very numerous, Funchal being full of them, besides many more being dispersed through

their country plantations. It is enough if the criminal can lay hold on the horns of the altar; and the utmost penalty they inflict is banishment or confinement; both which, by large presents, may be bought off."

The barbarous practice of burying the dead in churches is no longer followed in Madeira, and most of the parishes on the island have their cemetery. The principal cemetery at Funchal is a spacious plot of ground situate near the Poor-house. It has a handsome gateway of hewn stone, and is planted with cypresses.

At the time of the suppression of conventual establishments in 1834, there existed at Funchal five monasteries and three nunneries. The monks, "white, black, and grey, with all their trumpery," have entirely disappeared, and their houses are falling into decay. The chief monastery was that dedicated to St. Francis, the ruins of which are conspicuous at one extremity of the Praça da Constituicaõ. There was here a chapel, the walls of which were covered with human skulls. The property of all the monasteries was taken possession of by Government at the time the island passed into the power of Dom Pedro, on the final overthrow of Dom Miguel. Although the vows of the nuns have been annulled, and they are legally free to mingle with the world, a few sisters, the remains of larger communities, still

cling to their convents. The three nunneries were that of Santa Clara, with 46 nuns; that of the Incarnaçaõ, with 30 nuns and 4 pupils (both these belonged to the order of Franciscans); and that of Merces, with 26 nuns, called *Capuchas.* Permission was given to the nuns to leave their convents at the time the monasteries were suppressed; and though some availed themselves of the privilege, they returned to their seclusion after a brief acquaintance with the world. The convent of Santa Clara was founded in 1492, by the son and successor of the first *donatorio.* It stands on the site of N. S. da Conceiçaõ de Cima, the third of Zargo's churches, and his remains are said to lie within its precincts. The situation is fine, but the buildings, though large, are irregular, and without any beauty. The sisterhood, now about forty in number, derives a small income from land situate in and near the Curral. Here resides sister Clementina, whose beauty thirty years ago was the theme of many a traveller's praise.* At the convent of the Incarnaçaõ, founded by a canon of the cathedral, who gave up his quinta for the site, in 1660, there are now 20 nuns.

* "Reader! (says Henry Nelson Coleridge) if your whim or your necessities should lead you to Madeira, go for my sake to the nunnery of Santa Clara." The chapter on Madeira in this writer's "Six Months in the West Indies in 1825," is very amusing, but his enthusiasm and his impeachments should both be taken *cum grano salis.*

Novices being no longer admitted into these establishments, the inmates are gradually decreasing in number, and in process of time the sisterhoods will become extinct, when the government will take possession of their remaining property. The nuns support themselves in a great measure by the manufacture and sale of sweetmeats, feather flowers, and wax fruit, which are purchased by strangers as souvenirs of their residence on the island, or as presents for distant friends. This little traffic of the nuns is not of recent date; Atkins, who was here in 1720, speaks of the toys they sold him; and Forster, in 1772, tells us that his party was politely received by the nuns of Santa Clara at their grate, and that they deputed some old women to offer their artificial flowers for sale.

The Convento das Merces, founded in 1654, contains about 30 inmates, whose rule is more strict and more rigidly observed than that of the other nunneries. They have no assistance in the performance of their menial duties, and they seldom receive visitors, even those of their own kindred.

The Convento do Bom Jesus, founded in 1666, affords a temporary asylum to widows and married ladies who have lost for a time the society of their husbands. There are usually about 30 persons here.

The Convento de Santa Isabel was built in

1726, adjoining the Hospital da Misericordia, from which it may be distinguished by its grated windows. Female orphans are domiciled here, and they are only permitted to leave it in the event of a suitable offer in marriage, or of an opportunity for becoming domestic servants.

The receipts of the Municipal Chamber of Funchal in the official year 1853-4, amounted to 27,962 mil reis, and the expenditure to 25,539 mil reis. The receipts and expenditure in the year 1854-5 amounted to 23,030 mil reis, and 20,373 mil reis. The chief items of expenditure were lighting the streets, 3200 mil reis; repairs of streets, etc., 3288 mil reis; Lazaretto hospital, with 30 persons, 1390 mil reis; schools, 1932 mil reis; police, 24 officials, 2148 mil reis; salaries of the different *employés*, about 8400 mil reis. The income of the Camara is derived from a share of the government impost on grain imported, and from duties on salt, wine, fresh meat, and fish, and on shop licenses.

In Madeira there is no tax, nor any public fund set apart for the support of the poor, and up to 1847 there was not even a house specially provided for the reception of such as were houseless. In that year the present *Asylo de Mendicidade* was opened for the purpose, and the streets were considerably relieved of those who lay in wait to exhibit their rags and deformities to the passer by,

or to pour the tale of their distresses into his unwilling ear, with all the pertinacity of the well-educated mendicant. In the country districts, systematic begging exists as a matter of course, and to such an extent in some parts, that the pleasure of travelling is well nigh destroyed by the incessant importunities to which a stranger is subjected. The word first taught to the babbling infant is, "Give!" With years comes a longer invocation, but still the burden is, "Give, give!" whilst mature age and feeble eld are alike eloquent in their petitions for alms, either "*por amor de Deos*" (for the love of God), or; "*por sua saude*" (for the benefit of your health). About 200 persons are usually lodged in the Asylo, the expenses of which are paid partly by public subscription, and partly by the work of the paupers. The receipts fluctuate considerably from year to year; in 1854 they amounted to 4910 mil-reis, and the expenses to 3636 mil-reis. At the end of March 1856, there were 223 persons lodged here. A bazaar is usually held in the spring in aid of the funds of this useful institution. At the end of 1853 in the various places in Madeira for the reception of foundlings, there were 509 boys and 482 girls, and in Porto Santo 3 boys and 4 girls. The expenditure for their maintenance in Madeira amounted during that year to 1183 mil-reis, in Porto Santo to 284 mil-reis. There were 118

deaths amongst the Madeira foundlings in 1853, that is, about 12 per cent.

The chief hospital at Funchal, known as the *Santa Casa da Misericordia*, stands on the northern side of the Praça da Constituicaõ. The present building was erected in 1685 when Pedro de Lima was governor and captain-general. The first hospital founded at Funchal was one built by Zargo in 1454. Thirty years later it was transferred to grounds where the Rua do Hospital Velho now stands, granted by Alvaro Affonzo and his wife for the purpose. The existing hospital was founded by Royal charter in 1511, and the income of the earlier institution was shortly afterwards annexed to it. It has been liberally endowed at various times, both by the Government and by private individuals; but the mis-management has been great, and large sums have been lost beyond recovery, so that the funds will not allow of the admission of all the patients whom the building could contain. The nominal amount of its funds is nearly £40,000; and though much of this exists only on paper, its possessions are still considerable, the annual income being about £1800. A *Commissaõ Administrativa*, consisting of a president, treasurer, secretary, and two other members, manages the affairs; and the patients are attended by a physician, two surgeons, a druggist, with assistants and nurses. Although there are seldom

more than 90 patients in the wards at one time, the patients received into the hospital in 1853 were 798 in number; and in the two following years, 779 and 897. For many years there was an English ward here supported by funds contributed by the British merchants, and superintended by its own medical men. This was given up in 1838. Sick persons, being foreigners, are now admitted into the hospital on payment of 2s. 1d. a day, for which sum they receive food and medical treatment, but not drugs. The hospital has a chapel within its precincts, and a chaplain, paid out of its funds.

The military force on the island has an hospital of its own. The hospitals of Santa Cruz, Machico, Calheta, and Porto Santo, have been suffered to fall into decay; their funds have disappeared, and they exist only in name.

The *Hospital de Saõ Lazaro*, or Leper Hospital, stands on the west of the town near the sea. It usually contains from 30 to 35 patients, most of whom come from the districts of Ponta do Sol and Ponta do Pargo. This hospital is under the charge of the municipality of Funchal, having been founded by that body in 1665. The annual expenditure amounts to between thirteen and fourteen hundred dollars, including an annual allowance from Government of 150 dollars. Various donations and legacies have been made to the establishment, from time to time, by private individuals, which have enabled

the authorities to make considerable additions to the building. About two-thirds of the patients are males. The usual age of those affected with elephantiasis is from fifteen to twenty-five years, and none of the patients exceed the age of fifty; the majority die from the disease extending to the organs of voice, respiration, and digestion.

Soon after the death of the Princess Maria Amelia, her mother, the Empress-Dowager of Brazil, resolved to establish an hospital for the reception of poor consumptive patients, natives of the island or of Portugal or Brazil. A house was accordingly taken in the Rua do Castanheiro to serve as an hospital until a special edifice could be constructed. During 1854 the patients treated here consisted of 39 women and 26 men, all, with the exception of five, being natives of the island. In 1855, the patients received into the hospital were 50 women and 30 men, 73 being natives of the island. During the preceding two years and a half, 90 patients (56 women and 34 men), afflicted with phthisis, had been treated in the hospital, of whom 31 died. Nothing more is required of a patient who desires to enter the hospital than a satisfactory certificate of poverty and good conduct. Yet the occasions have been rare when all the 24 beds have been filled. The physicians attached to the establishment keep full accounts of the cases, the methods of treatment, and the results; and those interested in these

points will, doubtless, receive all the information they may require on applying in the proper quarter. It will be sufficient to state here that they report favourably of cod-liver oil as a therapeutic agent in cases of phthisis and chronic bronchitis. Attention should, however, be called to the fact that no more than 97 phthisical patients applied to enter this hospital and that of Misericordia, practically the only other hospital on the island, during the years 1854 and 1855, being at the rate of 48.5 per annum. Now, comparing this number with the population, the proportion of cases of phthisis is very small, and this will go far to refute the inference which certain physicians have attempted to draw from insufficient data as to the consumptive tendency of the people even in the climate of Madeira. On the 4th of February 1856, the foundation stone of a building intended for the *Hospicio da Princeza Dona Maria Amelia*, was laid with appropriate ceremonies, on a piece of ground on the west side of the city, by the Bishop of Funchal.

Attempts have been made at various times by the British residents and charitable visitors to Madeira, to found an hospital or sanatorium for the reception of British persons labouring under pulmonary complaints, whose pecuniary circumstances might prevent them undertaking a voyage from England, or incurring the expense of a resi-

dence on the island. These attempts were attended with only imperfect and temporary success, and no establishment of this kind now exists.

Two fruit and vegetable markets have been formed in different parts of the city. The one near the Convent of S. Francisco is spacious, furnished with neat wooden stalls, and planted with large planes. An excellent fish market was erected at considerable expense a few years ago.

Funchal possesses no theatre at present. There formerly stood a building of this kind on the piece of ground near the entrance to the governor's palace, but it was pulled down in 1833 by Don Miguel's troops, for the purpose of strengthening the defences. The English merchants held shares in this building, but their consent to its destruction was not obtained, neither did they obtain compensation for the loss.

The streets are dimly lighted, in the absence of the moon, with lamps fed with oil, chiefly physic-nut oil, imported from Lisbon. The cost of lighting during the official year 1853-54, amounted to £666.

The Prison stands near the Custom-house. The prisoners receive a very small daily allowance of food, but they are allowed to work in their cells, and to vend the produce of their labour. This will explain the mystery of the place where some

men with "foreheads villainously low" are seen behind iron bars, whilst in front, suspended by a string, are various articles of horn, such as combs and buttons.

The old buildings at Funchal which merit the stranger's notice are but few. Two curiously carved windows in the Rua da Boa Viagem, however, merit his particular attention. Some have conjectured that the building to which they belong was formerly the meat market. The house in which Columbus was thought to have resided, when he came to Madeira in his trading voyages, stood near the Carmo, but was pulled down in 1851. A large building in the Rua do Esmeraldo, called *Granel do Poço*, has likewise had claimed for it the honour of having been inhabited by the discoverer of America; but this is hardly likely, since, before the present Alfandega was erected, the building was used as a custom-house. A third claim has been put forward on behalf of a house near the Socorro, now no longer in existence.

The oldest date carved in stone which we have seen, is that over a gateway in the Rua das Aranhas, where the figures 1618 are visible alongside the coat of arms of the D'Ornellas family. There are several entrances at Funchal which remind one of Don Diego's house described in the history of the Knight of La Mancha, as having "the arms of the family carved in rough stone over the great gates."

Not far from the Carmo Church is the *Largo do Pelourinho* (Pillory Square), in the centre of which formerly stood the instrument of punishment, from which the name is derived. The pillory itself was removed about twenty-two years ago. In some of the retired parts of the town may be seen examples of the lattice-work, which was once very common, in place of glass windows. The pieces of lattice hang on hinges at their upper end, and are loose at the lower end, so as to admit of being elevated at the pleasure of those who wish to look out. In most of the houses, some of the windows are constructed in the old style, that is to say, they have no glass, but are closed with large shutters, in which are openings that have small shutters of their own.

A few years ago, a pier was thrown out into the sea, at the place known as the *Caes*, but as the foundation was not solidly laid, the greater part of the structure has been washed away.

The beach frequently presents an animated scene, especially on market-days, when fleets of boats arrive from the villages on the coast, laden with country produce, and manned by a swarthy set of fellows, more like savages than the inhabitants of a civilized country. They strip themselves almost naked when preparing to land or receive their cargo, and being excellent swimmers, they are accustomed to dive, like amphibious ani-

mals, beneath the breakers as they pass from the shore to their boats. Indeed, most of the boatmen and the children living by the sea are nearly as much at home in the water as the fish themselves. Heavily-laden boats are frequently pulled upon the beach by oxen. All weighty articles are conveyed near the town on sledges drawn by these animals. In the country, mules of a small breed are employed for this purpose, and carry heavy loads with great ease. The oxen are quiet and docile animals, whilst their drivers are a very noisy and boisterous set. Their stentorian voices are raised to a deafening pitch, as they goad the poor animals along, with their usual cry, "Ca para mim boi! ca—ca—ca—oá." (Here to me, oxen, here, here, here!) These animals are usually preceded by a boy, whose sharp note chimes in at intervals with the gruff tone of the driver in the rear, who, besides his goad, carries a wet rag, or a juicy cactus leaf, to drop at intervals under the sledge, in order to prevent its heating, and cause it to glide more smoothly over the pavement.

Having now described the principal objects in the city, as far as they seemed deserving of the stranger's attention, let us, before closing this chapter, take a stroll along the streets, and see what "common things" may be found worth notice there. We cannot have been many minutes

in any of the thoroughfares, before an ox-sledge, bearing a pipe of wine, a barrel of sugar-cane spirit, or a pile of luggage, will make its appearance, its approach announced by tinkling bells heard at intervals between the shouts of the driver. Then comes, perhaps, a string of miserable, care-worn donkeys, carrying pack-saddles laden with sand or stones. Entering the Cathedral square, we see groups of men seated in the shade of the trees, gaily chatting away the hours, or lazily enjoying their cigars, solitary and silent. Anon comes by a couple of priests in flowing black robes and curious hats. On yonder door-steps are lads with *carapuças* on their heads, and cards in their hands, calling to mind some of the juvenile gamblers Murillo has painted. They are as excited by the game as if they were playing for ten-guinea points, when perhaps the highest stake the winner can carry off is a five-*rei* piece, value one farthing, and that to be paid out of the contingent earnings of the loser next day. Stand aside, for do we not hear the prancing of horses? These are *burriqueiros*, shewing off the points and paces of their steeds before the newly-landed passengers of the steamer just anchored in the bay, whom, if we follow to the nearest market, we shall see expending silver coin in the purchase of bananas, guavas, figs, or oranges fresh from the tree. Turning into the nearest street, there is an

old woman roasting chestnuts, or frying odoriferous fish in a little pond of oil. As we proceed, we pass doors of shoemakers and cabinetmakers innumerable, the latter displaying walking-sticks, paper-cutters, rulers, and other articles made of the woods of the island. Now and then we come upon a man exercising the art of turning. His lathe is of curiously primitive construction; it is near the ground, and the operator is bent almost double as he works it by means of a string attached to a stick, using one of his feet to steady the cutting implement. This will remind those who have visited Damascus, of the carpenters who there hold the wood they plane by the toe. The coopers have been of late years less of a nuisance than in the flourishing time of the wine trade. They formed a guild, possessing peculiar privileges, one of which was, that they were at liberty to carry on their calling in the street. This was frequently done to the great inconvenience of equestrians and pedestrians. Now comes by a perspiring peasant, bearing on his head a bundle of fresh grass, the sickle that cut it hanging at his waist. Behind him is a girl, who has just descended from the mountains with a cord of dry underwood for the fire. What next?—a Portuguese lady in full dress, seated in her palanquin, and on her way to pay a visit to some other *eccellentissima donna*. The men carry her as if she were as heavy as she looks.

Not so the men with the hammock, at the bottom of which, wrapped in coats and shawls, lies some poor enfeebled invalid. Here is a woman seated at her own door, and plying her distaff of cane, on the look-out all the while for some one to help her through the next half-hour with pleasant conversation. Or there are two women, one with her head on the other's lap—but this scene we need not describe, so let us pass on to the shops.

Many of the shopkeepers adopt the plan of giving pictorial representations of the articles they deal in upon huge signboards, for the enlightenment of the unlettered peasantry. The same kind of picture-writing is seen even in Lisbon; and from a passage in Scott's Heart of Mid-Lothian, it seems that a similar practice formerly obtained in Scotland. Many small shops, frequented by the lower classes, are found in the town, and at intervals, along the roads, where maize, bread, spirit, salt fish, and firewood are the principal articles on sale. At several of these a board, mysteriously lettered P. V. B., hangs at the door; the interpretation of which is, that good bread and wine (*Paõ Vinho e Bom*) are sold there. Sometimes an A is added for *Aguardente* or spirit. If we pause to look into one of these small, dark wine shops, we shall see a decanter or two of liquor, with some glasses, ready for use, and a few

loaves of bread. What a contrast between such a place and its London equivalent, a gin shop! Some of the names over the shop doors afford, in their Augusto Cesar, Numa Pompilio, etc., unmistakeable evidence that this people has not forgotten its Roman descent.

CHAPTER VIII.

POLITICAL AND MUNICIPAL DIVISIONS — GOVERNMENT — LEGAL, ECCLESIASTICAL, EDUCATIONAL AND MILITARY AFFAIRS AND STATISTICS — ENTAILS — LANDLORD AND TENANT.

For administrative, municipal, and ecclesiastical purposes the island of Madeira is divided into nine concelhos, each with its *Camara Municipal;* and into forty-nine parishes (*freguezias*), each with its church and *Vigario.* In each concelho there is a delegate of the civil governor, proposed by him, but appointed by the Lisbon government, with the title of *Administrador do Concelho,* who is at the head of the police, and is the chief magistrate of the concelho. In each parish there is a *Regedor da Parochia,* a *Delegado* of the administrador, and a *Junta.* In the concelho of Funchal the election of members of the municipal chamber is vested in persons having a yearly income of 100 *mil-reis.* The members themselves must possess a yearly income of 200 *mil-reis.* In other concelhos a

qualification of 100 mil-reis is sufficient. The *camara municipal* of Funchal consists of seven members elected for two years. The president is one of the seven, elected by the others to serve for the two years of the chamber's existence. The parishes are thus allotted amongst the concelhos. 1. *Funchal:* Sé, N. S. do Monte, Santa Luzia, Saõ Gonzalo, Santa Maria Major, Saõ Pedro, Saõ Roque, Sant' Antonio, Saõ Martinho. 2. *Camara de Lobos:* Camara de Lobos, Campanario, Quinta Grande, Curral das Freiras, Estreito de C. de Lobos. 3. *Ponta do Sol:* Canhas, Magdalena, Ponta do Sol, Ribeira Brava, Serra d'Agoa, Tabua. 4. *Calheta:* Arco da Calheta, Calheta, Estreito de Calheta, Prazeres, Fajaã da Ovelha, Jardim do Mar, Païl do Mar. 5. *Porto Moniz:* Ponta do Pargo, Porto Moniz, Achadas da Cruz, Ribeira da Janella, Seixal. 6. *Sao Vicente:* Ponta Delgada, Boa Ventura, Saõ Vicente. 7. *Sant' Anna:* Sant' Anna, Fayal, Saõ Roque, Saõ Jorge, Arco de Saõ Jorge. 8. *Machico:* Machico, Agua de Pena, Sant' Antonia da Serra, Caniçal, Porto da Cruz. 9. *Santa Cruz:* Camacho, Caniço, Santa Cruz, Gaula. At Porto Santo there is only one concelho and one parish.

By a royal decree having the force of law, dated the 18th July 1835, Madeira was placed on a level with the provinces of Portugal, and it now forms, along with Porto Santo, one administrative

district. The chief authority is lodged in the civil governor, who is a delegate from the central government at Lisbon. Until 1854 the civil administration was separated from the military (a system still adhered to in all the other provinces of the kingdom), but in that year special circumstances induced the government to obtain leave from the Cortes for the union of the two authorities in the same individual. The present governor, who thus unites in his own person the chief civil authority with the chief military command, is his Excellency Brigadier-General Antonio Rogerio Gramicho Couceiro, a gentleman who has already, in a subordinate position, given such general satisfaction, that great hopes are entertained of a prosperous and happy administration of affairs as long as he occupies the Palacio de Saõ Lourenço. His salary from the two offices amounts to about £534. The governor has the assistance of two administrative bodies: the general Junta of the district, and the Concelho of the district. The first body is elected by the Municipal Chambers along with the respective councils of the municipality; the second, of which the civil governor is president, is nominated by the general Junta, which sends twelve names to the central government at Lisbon, out of which are selected the four effective members, and the two deputies composing the council.

Madeira sends four members (*Deputados*) to the

parliament *(Cortes)* at Lisbon. The electors are required to possess an annual income of 100 mil-reis; the deputados a yearly revenue of 400 mil-reis, unless they are *letrados*, that is, persons who graduated at some recognised place of education, such as physicians and lawyers, in which case no property qualification is necessary. The election of deputies was formerly indirect, now it is direct. The votes are taken in the churches on a Sunday. The mode of proceeding is this:— Forty of the wealthiest persons of each *concelho* choose seven persons, whose duty is to prepare lists of the persons eligible to be *deputados*, and of the electors. On the day of election four persons are first chosen by the electors present to act with one of the seven as a *mesa eleitoral* (electoral board) in taking the votes. The following Sunday the recorded votes are taken by a commissioner of the *mesa* to the Camara Municipal, and the choice of the electors is then declared. The *Deputados* receive an allowance of 2500 rs. per diem during the session.

The Treasury of the island (*Cofre Central*) is in the joint keeping of the civil governor the *Thesoureiro Pagador* (paymaster), and the *Delegado do Thesouro*, the last of whom is at the head of the financial department, and is in direct communication with the government at Lisbon. Appeals from the decisions of the chief of the

Custom-house are heard by a commission composed of the same three officers. The revenue of the island has much decreased since wine ceased to be made. The money levied at the custom-house, excepting a share of the proceeds of the duty on foreign grain, is paid into the public treasury, which derives other parts of its income from a duty on wine exported, a duty to the amount of one-seventh of the wine sold in the island, a small duty on fresh meat sold in the market, and a six per cent duty on the net value of fish sold. A duty is levied on most articles imported into the island, and the false system of protection to native industry is pursued. Then there are the tithes of all the agricultural produce of the island.

In the year 1855, the Treasury possessed a sum of £24,183, derived from the balance of the accounts of the preceding year, and from sums received during the year; and the sum expended in that year amounted to £23,044. The Home Secretary authorised the expenditure of £1799, the Minister of Justice £3288, the Minister of War £8752, the Minister of Marine £102, the Minister of Finance £3931, and the Minister of Public Works £5169. The receipts of the Custom-house (*Alfandega*) amounted in

Mil-reis.		Mil-reis
1840 to 129,492	1854 to	95,932
1850 „ 122,532	1855 „	82,254
1853 „ 115,521		(£17,125 : 18s.)

The law administered in Madeira is that of Portugal. The chief judges (*Juizes de direito*) are two in number, one for each comarca, the two parts into which the island is divided. They are appointed by the Crown from amongst the class of graduated doctors of law, and their income, derived partly from a salary paid by Government, and partly from fees, is supposed to amount to about £250. These judges are not allowed to remain longer than six years at any one place, and they are never appointed to exercise their functions in the district where they were born. The *Juiz de direito* has power to decide finally all appeals from the decision of the *Juiz ordinario.* Cases relating to realty, where the value at stake is more than twenty mil-reis, and those relating to personalty, where the amount in question is more than thirty mil-reis, are decided by the *Juiz de direito,* subject to appeal to Lisbon. With the assistance of a jury, he tries criminal cases, when the penalty is more than incarceration for six months, expulsion from the comarca, or a fine of forty mil-reis; but appeal lies from his sentence likewise in these cases to Lisbon. Those cases where the penalty falls short of what has just been mentioned, and yet is too great to permit him to deal with them summarily, are tried before the *Tribunal da Policia Correctional,* a body composed of the *Juiz de direito,* and four lawyers annually named by the

Camara municipal. A public prosecutor (*Delegado do Procurador Regio*), appointed by the Crown, is attached to the court of each *Juiz de direito.*

Criminals are tried before a jury composed of twelve persons, except in thinly populated districts, where nine persons may form a jury. Their verdict need not be returned unanimously; it is sufficient if two-thirds are agreed. From this verdict there is no appeal. A jury must also be empannelled on the trial of civil causes, unless the parties agree to dispense with their assistance, and this is almost invariably the practice. Formerly, an officer called *Conservator* was nominated by the British residents, subject to the confirmation of the Government, to try suits in which British subjects were concerned. But by the treaty of the 29th of July 1842, this office was abolished, and suits to which British subjects are parties are tried before the usual Portuguese judges. By the same treaty, it was stipulated that the jury summoned to inquire into charges against British subjects, should be composed half of Portuguese, and half of British subjects. Fortunately, no occasion has arisen in Madeira since the ratification of the treaty, for the empannelling of such a jury. During 1855, fifty-four persons were tried before the two Juizes de direito, and all were convicted. On the first of May 1856, there were 76 persons in prison (65 men, 11 women), 50 of whom were awaiting their trial.

Inferior to the *Juizes de direito* are three classes of judges, appointed by the people, to serve two years, and named *Juizes de paz*, *Juizes eleitos*, and *Juizes ordinarios*. The lowest in rank is the *Juiz de paz*. Every case in which the property in question is of greater value than six dollars, must be taken in the first instance before this judge, whose duty is to endeavour to heal the breach, and prevent the dispute being carried farther. His jurisdiction extends over one or two parishes, and his services are rendered gratuitously. The *Juiz eleito* has also one or two parishes under his jurisdiction, and his services are likewise rendered gratuitously. Cases relating to personalty, or arising out of injuries to real property (such injuries not being connected with a criminal act), are decided by this judge, when the amount in question does not exceed 1250 reis. Offences against the municipal bye-laws are prosecuted before him; but he has no authority to imprison, unless the law has expressly given him this power. He may inflict fines, and cause them to be levied on the goods of the offender; but if no goods should be forthcoming, there ends his authority. The *Juiz ordinario* has the power of deciding finally those cases (being disputes arising in respect to realty), in which the amount in question does not exceed four *mil-reis*, or (being disputes arising in respect to personalty) where the value in ques-

tion is not more than six mil-reis. He can also pronounce a final decision in all criminal cases where the penalty is not more than a fine of two dollars, or imprisonment for more than three days. Subject to appeal to the *Juiz de direito* he has jurisdiction over cases relating to realty, in which not more than twenty dollars are in dispute, or relating to personalty, in which the sum sought to be recovered does not exceed thirty dollars. Subject to a similar appeal, he decides criminal cases when the penalty is not more than a month's incarceration, or a fine of ten mil-reis. The appeal is to Lisbon when the sum in dispute is more than forty mil-reis. It is part of the duty of this judge to take the proceedings necessary for bringing cases, both civil and criminal, before the *Juiz de direito.* He receives some trifling fees from the suitors, but no salary. The district within which a *Juiz ordinario* has jurisdiction, is called a *julgado.*

The military order of Christ, instituted by Diniz I. of Portugal in 1319, has for its head the reigning monarch of Portugal, and in this order the spiritualities of Madeira are vested. Consequently, the Crown presents to all ecclesiastical dignities and benefices. The chief of these is the Bishop of Funchal, Don Manoel Martins Manso, whose bishopric was created as far back as 1514, and who receives a net yearly allowance of about £533. Within his diocese are not only the islands

of this group, but also the fortress of Argium on the African coast. The bishop is assisted by a *Provisor*, a *Vigario geral* (at present resident in Lisbon) a *Promotor*, an *Escrivaõ*, etc. The collegiate chapter of Santa Sé, or Cathedral of Funchal, consists of five dignitaries, twelve canons (one of whom has charge of the Confessional), and four minor canons. The dignitaries are dean, archdeacon, precentor, professor of theology, and chief treasurer. In addition to these there are ten chaplains, one sub-precentor, a chief sacristan, altareiro (or verger) chapel master, organist, master of the ceremonies, six chorister boys, two curates, a beadle, and a bell-ringer. The offices at present vacant, and not likely to be filled up, are those of precentor, chief treasurer, five canons, and two minor canons. In May 1856, there were in Madeira and Porto Santo 111 priests, a deacon (the chief priest at Porto Santo), and twenty minor clergy. The first church erected on the island stood at Machico; the second also built by Zargo, and dedicated to our Lady of the Beach, was thrown down in the inundation of 1803. The numerous chapels and shrines to be seen in ruins all over the island are a proof that these are not the palmy days of the Roman Catholic religion. The extreme poverty of the clergy, and the open disregard of their vows exhibited by some of them, do not tend to elevate them in the estimation of the community.

The tithes (*dizimos*) are received by government, which undertakes to make distribution of the proceeds amongst the clergy. The chief titheable articles are wine, grain, and *fruta d'espino* (oranges, lemons, etc.)

The peculiar court established for ecclesiastics was abolished in 1822, and the prison attached to it is remembered principally by the street bearing its name (*Aljube*). A priest charged with any criminal offence is now tried in the same manner as a lay person, whilst civil actions to which a priest is a party are tried by the ordinary tribunals. The bishop may suspend, but cannot deprive a priest of his benefice, until the proceedings are confirmed by the central government at Lisbon.

The Roman Catholic religion is the only one permitted to the subjects of Portugal; and though dissenters from that church are allowed the undisturbed exercise of their own forms, it is understood that any attempt to make proselytes, being contrary to law, will be strenuously resisted. The law declares that a crime is committed by the publication of thoughts that deny, or throw a doubt upon, any dogma defined by the Catholic Church, or that defend, as a dogma, the doctrines condemned by that church. Moreover, that mockery or derision of the Catholic religion, or of the worship approved of by that church, shall be punished, if published, sold, or placarded in different places,

or uttered at public meetings, by imprisonment from six months to three years, and a fine of from one hundred to one thousand dollars. If made in conversation, or by words publicly uttered in a loud tone of voice, they are punishable with imprisonment of from three to eighteen months, and a fine of from fifty to five hundred dollars. A few years ago, Dr. Kalley, a Scotch physician residing at Funchal, attempted to make converts to Protestantism, in which it was said he was very successful. His acts were doubtless in contravention of the Portuguese law, but he persevered in spite of repeated warnings that he would be held responsible for them. In the end he was obliged to fly from the island; for, instigated by the priests, the populace rose, sacked his house, and burned his books and papers. After much delay, and only under the pressure of applications from the British Government, partial compensation was made to Dr. Kalley by the Portuguese Government for the damage done to his property.

At certain seasons the religious processions attract many gazers from distant parts of the island into the streets of Funchal; but Protestants are more likely to be shocked than pleased with the ill-carved images of virgins and saints, gaudily attired in tinselled robes, which are then brought to parade the streets amid files of dignitaries, military, civil, and ecclesiastical. One of these processions

being seen, there will exist little desire on the part of strangers to witness another; but as to the natives they form green spots in the dull waste of the year, eagerly looked forward to, greatly enjoyed, and long remembered. At Easter, palm branches, plaited and adorned with flowers,* are borne about, and certain ceremonies are performed in the Cathedral in commemoration and symbolic of the early events of Christianity. Every church in the country has its annual festival (*festa*), and the people of the parish are then entertained for several days with music, banners, and floral arches, whilst gaily dressed crowds flock to kiss the hem of the saint's garment, and the priests pocket a considerable amount of pence. Christmas festivities are not complete in Madeira any more than in England, unless the churches and houses are decorated with green. At that time the country people will be seen bringing into town branches of cypress, Alexandria laurel, and sugar cane, with ferns and other foliage.

In connection with every church, there is a society of lay persons, comprising women as well as men, called *Irmandade* or brotherhood. This society has a chapel therein termed *Capella do*

* "When I have a government, quoth Sancho, I will send for the boy by post; but then be sure to clothe him so that he may look not like what he is but what he is to be. Send you money, quoth Teresa, and I will equip him *as fine as a palm branch*."

Santissimo Sacramenta, which it undertakes to keep in good order, and to furnish with lights and ornaments, out of funds derived from the property it possesses, or subscribed by its members. Another part of its duty is to see that the day of the saint to whom the church is dedicated is duly honoured, to organize a yearly festival, to fulfil the obligations as to masses, etc., of benefactors, and to attend religious processions. In Funchal two of these brotherhoods enjoy more distinction than the rest. To one of them the Carmo Church belongs; the other, since it has lost the church at the Convent of Saõ Francisco, has obtained a chapel in the Collegio Church. On the occasion of the funeral of any member of the *Irmandade*, it is customary for the survivors to attend his corpse to the grave.

The affairs of education in the kingdom of Portugal are under the control of the Superior Council of Public Instruction, which holds its meetings at Coimbra, under the nominal presidency of the Home Secretary. By a law enacted in September 1844, it is compulsory on parents to send their children to a place of public instruction. Unfortunately this law is not enforced. It was calculated in 1856 that there are 17,900 children in Madeira, who ought by law to be attending school, whereas only 2303 were actually sent there, and of these not more than 648 attended with regularity. This is an example of the excel-

lent paper laws of Portugal, and of their neglect and virtual abandonment in practice. In March 1855 there existed in Madeira 12 elementary schools, with 197 scholars; and 49 Sunday schools, with 2392 scholars; of the latter class of schools, 23 were schools supported by the municipalities, and 14 schools supported by the state, which expended during 1854 the sum of 1674 mil-reis upon them. Under the head of Secondary Schools there existed the Lyceo at Funchal, with six professors and 121 pupils. The building employed belongs to the Government, and the professors are paid by the state. The cost in 1854 was 2134 mil-reis. To the class of Special Schools belongs the Seminario, exclusively devoted to the instruction of young priests in theology, morals, Latin, and the arts of music and chanting. This institution has landed property in various parts of the island, and Government contributes about £250 annually to its support. The pupils in 1854 were 24 in number, the majority of whom were lodged, fed, and educated in the establishment free of charge. Into the class of special schools falls also the Medico-chirurgical School, at the Hospital da Misericordia, with four chairs supported by Government at an annual cost of 862 mil-reis. Only seven pupils attended the lectures in 1854. In 1856 twenty additional primary schools were ordered by the Government to be opened in the district of Funchal.

The number of troops of the line in Madeira is frequently altered, but in May 1856 there was a battalion of infantry of the line, and a small detachment of artillery, together between 400 and 500 men. Madeira forms one of the military divisions of Portugal. All the male natives between 18 and 25 years of age are liable to be called upon to serve as soldiers. The expense of the military forces during the official year 1854-55 was 46,346 mil-reis = £9655. In addition to the above, there is a militia termed *Artilheiros Auxiliares* (Auxiliary Artillery), composed of fifteen companies, and numbering 1200 men. Four of these companies are stationed at Funchal, and one at Porto Santo; the others are at various places in Madeira. The only officers belonging to the line are the major commanding, and the captain, who is also adjutant. Officers and men have to find their own clothes; but they receive a small sum for pay when on duty; the pay of the common soldiers is only 20 reis per diem.

Although the owner of an unentailed estate has full power to alienate it by an instrument to take effect in his lifetime, his widow, if he should have one, is absolutely entitled on his decease to one half of the whole property of which he may die possessed, and his heirs in direct descent or ascent are entitled to two-thirds of the remainder, notwith-

standing he may have attempted to give it by will to others. In other words, if a testator should leave wife and children, he can give to others no more than one-sixth of his property, since the former has a valid claim upon three-sixths, and the latter upon two-sixths. Of course, if a settlement was executed on marriage, its terms will regulate the division. If there should be no widow, the direct heirs are absolutely entitled to two-thirds of the whole property. If there should be no heirs in direct descent, or ascent, then the whole of a man's property will pass by his will, even against his brothers. In the event of there being no will, nor any widow, the heirs take the whole; and if there are no relations within ten degrees, the property lapses to the state. These laws are applicable to the landed property, but not to the personalty, of foreigners resident in Madeira. Males and females take equally, there being no law of primogeniture, nor any law enabling males to exclude females, as in more enlightened England. Many attempts have been made of late years to abolish entailed properties altogether, but these attempts have not hitherto been successful. As the law stands at present, an entailed property (*morgado*) can be absolutely alienated only when its net annual value is less than 200 dollars (£41 : 13 : 4) a year. In case several *morgados* belong to the same person, each having a less annual value than

this, he cannot alienate any one, if the income of the whole should exceed 1200 dollars. A tenant for life without heirs of entail may cut off the entail, whatever the value of the property. Formerly he could not do this, and upon his death the property fell to the Crown. The last law on this subject was passed in April 1832. It contained various clauses enabling the tenant for life to exchange and lease entailed property. The facilities thereby given are sometimes used, though cautious lawyers speak of doubts and difficulties attending the proceeding, to effect what amounts to cutting off the entail. A law passed in Pombal's time forbade the future creation of *morgados* unless the property yielded an income of 1200 dollars a year, and even then the special license of the Crown must be obtained.

The system by which the relations of landlord and tenant are regulated in Madeira is universally condemned, and yet there are great practical difficulties in the way of its alteration.* Every tenement consists, in point of fact, of two parts which belong to different parties. The landlord (*Senhorio*) is the owner of the bare land, and of the water which is brought periodically to irrigate it; all the rest, cottages, walls, pavements, in short everything

* Dr. Peacock's able memoir "On the Agriculture and Tenure of Land in Madeira" may be profitably consulted by those interested in these subjects.

which has been the work of man, called collectively *bemfeitorias*, nay even trees and plants, belong to the tenant (*colono*), who if he have a house upon the land is named *caseiro*, if not, a *meyro*. The produce of the land ought by law to be divided equally between the landlord and tenant; a very unjust arrangement to the latter if strictly carried out; but in effect the landlord forgoes his claim to a share of the grass and vegetables, or the tenant somehow manages that he does not receive it. If quarrels arise between them, as is very apt to be the case, the landlord's position is little improved by his insisting on a strict performance of the tenant's duties, for as the latter has absolute power over the land, it is dealt with or neglected, so as best to obtain his own object. It is true that the landlord can eject his tenant at any time on paying him for the *bemfeitorias*, but as the mode of valuing them makes the price an excessive one, and as the landlord is generally without ready money, the tenant practically enjoys permanence of tenure. The latter on his part may sell the *bemfeitorias* to whom he will, for he is absolute owner of them; and when he dies they pass like any other property to his heirs or devisees, and on the other hand the heir of the *Senhorio* takes the property, subject to the rights of the tenant. In creating these *bemfeitorias* there is little to restrain a tenant from improving his *Senhorio* out of his property; for

though he may not erect houses for which he has a right to compensation in case of eviction without the consent of the landlord, he may construct almost anything else—walls to support the land, levadas, embankments, etc., at his pleasure. For the purpose of putting a value upon the rights of tenants, two officers, called *avaliadores* or *agrimensores*, are annually appointed by the camara to act in the concelho; but the parties usually agree privately upon their own valuers.

CHAPTER IX.

AGRICULTURE AND GARDENING.

If Homer's beautiful description of the Phæacian Isle, where fruit succeeded fruit, and flower followed flower in rich and endless variety, be applicable to any modern one, it is to Madeira.

Bowdich.

EVERY stranger is struck on landing at Funchal by the tropical forms of vegetation which luxuriate here to an extent beyond what he could well expect to find in this latitude. It is true that in the south of Spain there are districts where plants are found growing in the open air, which in England and central Europe are only seen in hot-houses. In the neighbourhood of Seville, Malaga, and Valencia, for instance, there are orange and citron groves intermingled with palm-trees. But at Funchal, besides these plants, we behold the Banana, the Coffee tree, and the Sugar Cane in such quantities as to impress us forcibly with a feeling of the tropics—a feeling which is not lessened when we look into the gardens, and see the Screw Pine, Papaw, Rose Apple, Mango, Jaca, Guava, Custard Apple, Pine Apple, Passion-flowers, Bignonias, Coral-trees, Acacias, Yuccas, Dracænas,

It was a chosen plott of fertile land,
Emongst wide waves sett, like a little nest;
As if it had by Nature's cunning hand
Bene choycely picked out from all the rest,
And laid forth for ensample of the best:
No dainty flowre or herbe that growes on grownd
No arborett with painted blossoms drest
And smelling sweete, but there it might be fownd
To bud out faire, and her swete smels throwe all arownd.

The Faerie Queene.

Aloes, Agaves, Cactuses, Fourcroæas, several species of Ficus, Capsicum, shrubby Euphorbia, and many other inhabitants of hot climates. It will give some idea of the limit of the climate, to mention that the Bread Fruit tree cannot be reared in the open air; that the Cocoa-nut palm will only live in a stunted state; and that the Physic-nut shrub (*Jatropha purgans*) is dwarfed, and produces very little of the fruit which at the Cape Verdes is very abundant.

As we advance into hotter regions, the element water becomes of more and more importance to the cultivator of the soil. In the summer there are long intervals without a drop of rain, whilst the ground is exposed to a burning sun; and it is therefore manifest that, unless the vegetation can be artificially supplied with moisture, it must perish. In Madeira there is a much larger fall of rain on the mountains than in the lower region, and sufficient moisture is there deposited to feed perennial springs which flow through the ravines in rapid course to the ocean. With the view of utilising this valuable article, numerous channels, called *Levadas*, have been laboriously constructed of masonry, or out of the solid rock, by which a supply is brought from some point high up amongst the hills to the cultivated lands bordering the shore, where it is distributed in regular rotation to the different proprietors who have acquired

rights by prescription or purchase. Each *levada* is under the management of a committee, elected by the persons whose land is watered by it; or a single person, called *Juiz da Levada*, who is generally the largest landed proprietor of the district, is entrusted with the control of the stream, receiving, by way of remuneration for his services, a run of twenty-four hours. The right to a supply of water is very strictly looked after; this is a commodity much more often in the market than land itself, and disputes arising out of claims to it are of frequent occurrence, affording a very profitable source of income to the lawyers. Each piece of ground within the district of a given *levada* is entitled to so many hours' use of the stream in the *giro*, or space of time occupied in making the tour of the whole district, which *giro* varies from 15 to 40 days according to the extent of the district. The actual serving out of the water is under the management of a *levadeiro*, an officer who is said not to be beyond the reach of a bribe. It is very amusing to witness the excitement of the persons who are set to distribute a run of water over a piece of ground, when the stream at the appointed time rushes in through the hole in the wall. Armed with *enchadas*, they rush about, bawling, as is usual with Portuguese when there is work to do, at the top of their voices, whilst they divide the main stream into

several minor ones, which are directed by means of small furrows over the whole inclosure. This, too, is the time for filling the tank, which every garden contains.

It is on the south side of the island that water is most needed; and there have been several attempts to make some of the streams which flow northward available for the irrigation of the southern slopes. "What sums of money," says the Baron von Humboldt, "have I seen expended uselessly in the Spanish colonies on undertakings founded on erroneous levelling!" The history of Madeira *levadas* will shew that the Portuguese have successfully followed the example of their cousins. At the head of the Ribeira da Janella, on the northern side of the main crest of mountains, there are some copious springs of water, the utilisation of which had been long in view; and accordingly, in 1836, the works were commenced by which the water was to be conveyed to extensive tracts of uncultivated land lying above Calheta and the Paül do Mar on the southern side. A watercourse of about 600 feet in length was cut along the face of a vertical rock, at a height of perhaps 300 feet from its base, at a place called Rabaçal.* This caught the streams of water as they trickled out of a natural reservoir 600 feet above, and down the face of the precipice. It was then made to wind into the

* Rabaçal is well represented in one of Mr. Eckersberg's Views.

clefts and round the breasts, until it brought its contents to the ridge which formed the dividing screen between north and south. Here a tunnel forty feet high and wide was carried through the hard rock for 1400 feet, until it reached the south side. It was then found that this vast labour was without result, for in order to pass through the tunnel the water must have gone up hill, which it refuses to do in Madeira, as well as elsewhere. The engineers had made a miscalculation to the extent of fifteen feet; and those who were next consulted advised not only the construction of a new *levada*, but of a new tunnel at another point. The *levada* was begun, but before the new tunnel was commenced, the management of the works passed into other hands. The old tunnel was had recourse to, its level was lowered, and ultimately the water made its appearance at its southern extremity, much to the delight of all concerned.

To take another case: a joint-stock company began the formation, in 1840, of the Levada do Furado, by which it was expected that water would be conducted from the Ribeira do Balcaõ, one of the branches of the Ribeira do Fayal, to the Lamoceiros, and thence behind Sant' Antonio da Serra and Camacha to the heights above the eastern part of Funchal, the total distance, including windings, being about 45 miles. The estimated cost

was 9000 dollars, but the actual expenditure amounted to 41,000 dollars. The worst part of the story, however, remains to be told; for, though water will flow as far as S. Antonio da Serra, where it was not much needed, it will not run any farther, and consequently the great object of the undertaking, namely, the irrigation of the arid slopes on the east of Funchal, has not been realised.

The soil of Madeira, assisted by an atmosphere of warm and equable temperature, and an abundant supply of water, would produce the fruits and vegetables of nearly the whole globe, if natural advantages were seconded by the art of man. Unfortunately not only great ignorance as to good modes of cultivation exist, but also great apathy and an intense dislike to every kind of innovation; consequently little is done beyond supplying the ground with water by artificial irrigation in the intervals of dry weather. Few of the fruit trees are pruned or grafted, nor is the soil improved in the manner appropriate to the peculiar requirements of the various plants. It is not to be wondered at, then, if the fruits are not of the best quality, and if the vegetables are much inferior to those produced by experienced horticulturists in England.*

* Mr. R. C. Smith is now making an attempt to establish a horticultural garden at Funchal, with the view of combining a skilful system of cultivation with the advantages of the climate. He has already introduced many new plants likely to be of permanent utility to the island.

A large portion of the surface of Madeira is unfit for cultivation. The upper districts, the region of the heath and bilberry, which constitute fully one third, are too barren and exposed for the production of grain; and a large portion of the remainder is either bare rock, or too precipitous for tillage; so that probably not more than one-half of the island is actually cultivated. On the south side the extreme height of cultivation is estimated at 2500 feet, except in a few favourable situations, where the height of 2800 feet is reached. On the north side, owing to the more copious supply of water, cultivation attains a greater altitude, and in Ribeiro Frio it is found at upwards of 3000 feet. The agricultural implements in use are few in number and of the rudest description; they consist of the *enchada*, a slightly curved and short pickaxe; the *arado*, or plough, a most primitive instrument, almost entirely of wood, and somewhat resembling the *aratrum* of the ancient Romans; the *fouce* or *foucinho*, a rough-toothed sickle, used in cutting grass; and the *podaõ*, a pruning-knife bearing some resemblance to our bill-hook.

A few years since, an agricultural society was constituted under high patronage, and great hopes were entertained of the good to be effected through its agency. It still exists, but the advantages expected from it do not appear to have been realised.

There is seldom any rotation of crops, or change

of cultivation. Bearded wheat and barley are grown on the same lands from generation to generation, with hardly any application of manure, so that it need not be matter of surprise that the average produce is very small, rarely exceeding ten bushels per acre; whilst the produce of rye grown in the upper districts is even less. Bearded wheat is more extensively grown than any other cereal, and of this an eight or nine fold return is considered an average yield. The grain is hard and semi-transparent, and commands a better price than most of the imported qualities. The sowing time is from October to January, and the harvest takes place in May or June. When ripe, the whole plant is usually pulled up by the roots, and the grain is extracted from the ear by means of oxen, which draw a sledge armed with stones or pieces of iron on its under side, over the ears as they are thrown down upon the floor of circular inclosures, called *eiras*. These threshing floors are usually placed on some exposed ridge or point, like the old shieling hills of Scotland, in order that the operation of winnowing may be effected at the same spot. The process consists in tossing the grain into the air when there is sufficient wind to carry off the chaff. The Old Testament injunction, "Thou shalt not muzzle the ox that treadeth out the corn," is still rigorously observed.

Maize has been much more cultivated of late

years than formerly, especially at the north. With all the increased cultivation of cereals, however, that has taken place since the vine ceased to yield its fruit, the total quantity produced does not equal more than five months' consumption of the inhabitants, and large importations are made from the African coast, the Azores, and the Mediterranean.

Many small water-mills for grinding grain are scattered about the island. They are usually of a very simple construction; a stream is diverted from a *levada*, and conducted to the top of a vertical wooden pipe which narrows downwards. The water rushes out of the lower end of the pipe upon a small horizontal wheel, and this actuates one of a pair of stones made of a basalt somewhat similar in texture to the trachyte of which the famous mill-stones of the Eifel are constructed. Hand-mills of the same material are common, and by their primitive form carry one's thoughts back to a very early period. By means of a bit of wood inserted in the upper stone it is turned round upon the lower stone, into a hollow of which it is made to fit.

What was once the staple growth of the island, the Vine, must have a chapter to itself.

The Sugar Cane was brought to Madeira soon after the discovery of the island from one of the Mediterranean islands, and in course of time its produce became the staple of the place. Hence

the sugar loaves on the shield of Madeira. At the end of the fifteenth century there were 120 sugar mills on the southern coast, the first of which was erected near Machico in 1452. A great number of slaves were then employed in the plantations and in making sugar; but the cane being transferred to the West Indies, the produce there was so abundant that it gradually declined in Madeira, and the number of mills dwindled to three. The grape disease, however, has again caused the plant to be extensively cultivated, and thousands of acres are now planted with it. No sugar is now made from the juice, the machinery being expensive, and the produce probably insufficient to render competition with foreign sugar possible. A little of the juice (*garapa*) is made into *mel* or syrup, for preserves and other purposes; but the chief part, after undergoing fermentation, is distilled into an ardent spirit (*aguardente* or *caxaça*) which is consumed by the labouring population in place of the lowest class of wine which formerly fell to their share. Ten large stills were in operation at Funchal in the spring of 1856, besides several in other parts of the island. About eight gallons of spirit are obtained from forty gallons of juice. The quantity of juice yielded by the sugar cane crop of 1855 was estimated at 311,500 gallons, and the average price it obtained was 2200 reis the gallon of four almudes. Sixty-four pounds of cane

gave nearly four gallons of juice. Up to the present time the cultivation of sugar cane has been found much more profitable than that of the vine had been for many years previous to the appearance of the disease; but large profits have a tendency to bring about over-production, and it is not likely that the present high prices of the juice will be permanently maintained. In 1856 eighteen mills were at work in different parts of the island, extracting the juice by crushing the canes, and the machinery of some of these was of the best construction, having been recently imported from England. Bullocks are in most cases employed to communicate motion to the machinery, but water is used when practicable. The cane flourishes best in hot situations, where it can receive a plentiful supply of water. The upper limit of its cultivation on the southern side may be estimated at 1000 feet. On the northern side it will only succeed in a few spots where the warmth, from local circumstances, is greater than elsewhere, such as Fayal and the Arco de S. Jorge. It rapidly exhausts the soil, and requires, what it seldom obtains, large doses of manure. It is propagated by cuttings of the stem; a piece a few inches long, containing one or two joints, is placed in the ground, and being watered, readily takes root. It must have two years' growth before it is cut. The leaves afford excellent forage; they are long and grass-like, and from their peculiar yellowish

green hue, a field of cane may be distinguished at a distance from every other crop. The flower appears in January in the shape of a tuft of silky fibre, of a purple colour. March is the month for cutting, and great is the commotion of the whole population at this time; for even the children come in for their share of the crop. Urchins of all ages may be seen everywhere dealing with fragments of cane as boys in England deal with stick-liquorice.

The Coffee shrub thrives remarkably well in low damp situations near Funchal, and its produce is highly esteemed on the island, where it sells for a higher price than the imported berry. The shrub is a pretty object when full of its white and sweetly-scented blossoms, which contrast well with its dark glossy leaves; and again, when its boughs are studded with berries, which are red when ripe. Here and there the Date Palm *(Phœnix dactylifera)* rears with picturesque effect its tall column crowned with a spreading crest of leaves. At Santa Cruz, Mr. Grant has a palm tree fifty feet in height, which sometimes produces bunches of fruit weighing 80 lbs. Its fruit, however, is very poor in comparison with the dates of the East; for the true palm climate, according to Humboldt, has a mean minimum temperature of 78° F. The same writer notices the association of the palm in all regions of the earth with the banana. In Madeira this plant is so

plentiful in several species or varieties, that it communicates quite a tropical aspect to the gardens about the town. It produces throughout the year abundance of excellent fruit,* which is occasionally sent in small quantities to London. The upper limit of the banana may be placed at one thousand feet.

Besides these plants, the gardens contain several other natives of the tropics. The Annona or Custard Apple tree *(Annona reticulata)* and the Guava-tree *(Psidium pomiferum)* have been brought from tropical America; the Jambos or Rose Apple tree *(Jambosa vulgaris)*, the Mango tree *(Mangifera indica)*, and the Papaw *(Carica Papaya)* from India. The Custard Apple is perhaps the most delicious fruit of the island, but the size and quantity of the fruit are usually small; and it is so liable to decay after being gathered, that it rarely reaches England in an eatable state. Whilst the Pine Apple, Annona, and the common Guava are found in every garden, the Mango, the Papaw, and the Loquat *(Eriobotrya japonica)*, a fruit tree of Japan, are at present much more rare,

* In an account of Madeira printed in Astley's General Collection of Voyages and Travels (1745), we are told that "the banana is in singular esteem and even veneration, being reckoned, for its deliciousness, the forbidden fruit. To confirm this surmise they allege the size of its leaves. It is almost a crime inexpiable to cut this fruit with a knife, because after dissection it gives a faint similitude of the crucifixion; and this, they say, is to wound Christ's sacred image."

though rapidly spreading. The trees producing the fruits called Pitanga *(Eugenia Michelii)*, Cheri-Moyer, *(Annona tripetala)*, Mammee Apple, *(Mammea africana)*, Alligator or Avocado Pear *(Persea gratissima)*, Tamarind *(Tamarindus indica)*, and Longan *(Nephelium Longan)*, may be found in some of the gardens. Several new kinds of Guava have been lately introduced into private gardens, as well as a number of fruit trees from Brazil, the West Indies, and Africa. The fruits of temperate climates, such as apples, pears, mulberries, plums, peaches, apricots, figs, and pomegranates, are produced in abundance, but their quality is generally far from being so good as it would be under better cultivation.

The Orange tree is plentiful all over the island, under the height of fifteen hundred feet. It adds much to the adornment of the country, with its shapely but somewhat formal contour, and its dark green foliage; especially in winter, when the oak, the plane, and the vine are stripped of their leaves, and this tree is loaded with ripe fruit. This fruit, however, is much inferior to that of the Azores, simply because in the latter place the tree is properly looked after, whilst in Madeira it is neglected. With similar attention the orange would form a valuable article of export. The amount of shipments has much increased of late years, the oranges being sent off early, so as to

arrive in England before the produce of other orange-growing countries can be obtained. The best fruit is grown on the northern side. A small variety, called the Tangierine orange, is much esteemed. A good deal of wine has been recently made from the juice of the orange.

The fruit of the Citron-tree, which is abundant at the north, was at one time exported in considerable quantities. It is still candied for consumption on the island by the nuns of Santa Clara as well as by others. A few thousands are sent annually to England, some of which are preserved in strong brine.*

Arrow root of good quality is prepared from the root of the *Maranta arundinacea*, which is grown principally at Magdalena. An imperfectly cleaned kind is hawked about by the country people, and sold as low as threepence or fourpence a pound. The cotton and tobacco plants have been found to grow well, but the sale of tobacco is a government monopoly, and its cultivation is prohibited. A little oil is obtained by the country people from the Castor-oil plant (*Ricinus communis*), which grows luxuriantly, and sows its seed plentifully. A cane (*Arundo donax*) was cultivated for the sake of its stem, of which the vine trellises were constructed. Here and there may be seen

* In 1855 the declared total value of oranges, lemons, and citrons exported, amounted to £291. The whole went to England.

the graceful Bamboo (*Bambusa arundinacea*) rising from the earth in small groups, and waving like tall feathers in every breeze. The Tea shrub has been found to succeed well at an elevation of between 2000 and 3000 feet. Mr. Veitch uses in his household no tea except that produced by his own plants. Cabbages, onions, tomatos, red pepper, common potatoes, and sweet potatoes, are planted round every hut. The last is a species of Convolvulus (*C. Batatas*) with a tuberous root, propagated simply by placing a piece of the creeping stem in the ground. It gives two crops a year, but a variety has been lately brought from Demerara which yields three times, and in favourable situations four times in the year. Its leaves form excellent food for cattle. This plant requires heat, and for that reason the north affords only a few places where it will thrive. The common potato of late years has been much attacked by disease, but it is well adapted to the soil of the upper districts, where as many as three crops are obtainable, though seldom obtained, from the same ground in one year. Various kinds of Pumpkin and the Chou-Chou (*Sechium edule*) are trained over the straw roofs of the huts. The Bottle Gourd (*Cucurbita Lagenaria*) is often seen creeping along trellis-work with its singularly shaped fruit hanging downwards through the meshes. The leathery rind of the ripe Gourd is frequently

used (like the shell of the Calabash fruit in tropical America) as a vessel for carrying water, or holding a modicum of spirit, a twig of willow being twisted round the middle by way of handle. In places which can be kept in a swampy state by frequent overflows of water, the Inhame or Yam (*Colocasia esculenta*, or *Caladium nymphaeifolium*), is cultivated as far up as 2600 feet above the sea. It is an entirely different plant from the Yam of the West Indies, a few species of which, however, exist on the island, though they are not in common cultivation. The Inhame belongs to the Arum order, and is known in the South Sea islands under the name of *Kalo*. It is grown there as well as in Madeira for the sake of its tuberous roots, which form, in the latter place, one of the chief articles of the peasants' food, sometimes weighing 120 lbs. They are usually boiled, and require considerable care in cooking, but even when they have obtained this care, they are coarse and harsh to the taste. The large handsome leaves are acrid, and can only be used as food for pigs.

The more delicate vegetables for the table seldom find their way into the market, being only grown in private gardens.

Encouraged by the success attending the cultivation of cochineal at the Canaries (whence 442,652 lbs. were exported in 1854), some of the Portuguese merchants finding their occupation

taken from them by the vine disease, have formed plantations of Cactus with the view of opening a branch of commerce hitherto unknown in Madeira. As far as the experiment has been tried, there is reason to think that it will be attended by a perfectly successful result.

A little flax is grown on the island, which is employed in the manufacture on a small scale of towels and napkins, the coarser part of the produce being made into sacking and ropes.

A considerable quantity of the lichen called Orchilla weed (*Urzella*) was formerly collected, but a heavy duty having been imposed, the legitimate exportation ceased to be profitable. A little is still shipped, but in a clandestine manner. The Madeira weed is considered inferior to that obtained at the Canaries.

The Oak (*Quercus pedunculata*), the Plane (*Platanus occidentalis*), the Cedar of Goa (*Cupressus lusitanica*), and the Cypress (*Cupressus fastigiata*), have been planted a good deal in and about the town; and large tracts on the hills are covered with plantations of Pine (*Pinus maritima*) and belts of Chestnut (*Castanea vesca*), the fruit of the latter furnishing the country people with a large supply of food. This tree is, however, unfortunately afflicted with a disease which is killing great numbers at the north. The Walnut is tolerably abundant, and the St. John's Bread-tree (*Ceratonia*

siliqua) is not uncommon, but in few cases has it attained to a large size. In the larger gardens may be seen, along with trees already mentioned, the Cork Tree (*Quercus suber*), the *Eucalyptus robusta*, as well as several other *Eucalypti*, (the Gum trees and Stringy-Bark trees of Australia), the Camphor-tree (*Laurus Camphora*), the Brazilian Pine (*Araucaria brasiliensis*), the Norfolk Island Pine (*Araucaria excelsa*), the Honey Locust-tree (*Gleditschia triacanthos*), the India-Rubber tree (*Ficus elastica*), the Sago Palm (*Cycas revoluta*), the Silk Cotton tree (*Bombax Ceiba*), the Tulip-tree (*Liriodendron tulipiferum*), and such inhabitants of warm regions as *Brexia madagascariensis*, *Jacaranda cærulea*, *Carolinea alba*, *Astrapœa Wallichii*, *Cecropia palmata*, and *Sterculia platanifolia*.

In Madeira no month is without its flowers, and the gardens are gay even in the depth of winter. Roses are blooming at all seasons; why then boast of the "biferi rosaria Pæsti?" The gayest months are April, May, and June, when the chill rains of winter have ceased to fall, and the heats of summer have not yet set in.

To give anything like a complete list of the flowering plants that adorn the gardens of Madeira, would be a work of considerable labour, which, if executed, would occupy many pages that would contribute little to the entertainment of the general

reader. Suffice it to say, that in addition to most of the plants found in an English garden, there will here be seen growing freely in the open air, the deliciously scented Sweet Olive, Brown Magnolia, Cape Rose, Heliotrope, and Indian Jasmine, the gaily painted Pride of India, Oleander, Poinciana, flowering Banana, and Lily of the Nile, along with species of *Bougainvillæa*, *Hoya*, *Allamanda*, *Hibiscus*, *Begonia*, *Strelitzia*, Bottle Brush, *Camellia*, *Ipomœa* and Passion-flower. Perhaps the most striking plants in the sight of a newly arrived visitor, are the Orange Bignonia (*B. venusta*), a shrubby climber with long finger-shaped flowers, the White Trumpet flower (*Brugmansia suaveolens*), and the *Poinciana pulcherima*, a Euphorbiaceous shrub with conspicuous crimson bracts.

The island sheep are of a miserably poor quality, yielding a small weight of tasteless or rank mutton according to circumstances. Of late years, however, the breed has been much improved by crossing it with English sheep. In the same way the breed of horned cattle has been greatly improved, and the beef is now of a fair quality. The cows yield a small quantity of poor milk, owing probably to the deficiency of good pasturage. Oxen are universally employed for draught; they are small, handsome animals, and are well taken care of during their years of work. This cannot be said of the asses, which are the most forlorn

and wretched creatures imaginable. A good many goats are kept in the neighbourhood of Funchal for the sake of the milk. Swine are commonly kept by the peasantry, bacon being a favourite article of food. It is not unusual for an island capitalist, or an owner of land, to purchase cattle or pigs which are fed by the occupier, and when the animals are sold, the proceeds are divided equally.

CHAPTER X.

THE VINE AND ITS PRODUCE.

THE wine of Madeira, which has acquired a world-wide celebrity, will soon be no more than a thing of history. In the spring of 1852, a disease suddenly shewed itself which, in process of time, destroyed the grape and ruined the prospects of the hardly-tasked cultivators. With each returning spring since that time, the same disease has re-appeared; the vine has ceased to produce fruit, and where it has not been rooted up it is gradually dying away. During this time the stocks of the merchants are disappearing without being renewed; and it is calculated that in two or at most three years, not a pipe of wine will be left in the island. The cause of this great misfortune has not been ascertained; all that we know is, that a minute fungus called by botanists *Oidium Tuckeri* appears in the shape of a white powder upon the leaves and fruit; but whether this fungus is the cause or only a symptom of the disease has not been made

out. Various remedies have been proposed and tried, but none of them has succeeded sufficiently well to induce its continued application. Under these circumstances, although we cannot altogether exclude from our pages a description of the wines of Madeira, and the cultivation of the vine, our account will naturally be shorter than it would have been if the vine had still been vigorous and productive.

The vine was probably introduced from Cyprus in 1425, but it was not actively cultivated till the early part of the sixteenth century; and it is more than probable that the finest descriptions were introduced by the Jesuits at a much later period. The wines from their estates excelled all others, and long after the property had passed into other hands, the produce had a preference in the market. A glimpse at the early state of the wine trade in Madeira is afforded by Atkins, who was there about 1720. The trade was then by barter; provisions were most in request, and then articles of clothing. He tells us that he bought a pipe of wine for two half worn suits; and another pipe for three second-hand wigs.

The vine was propagated from cuttings, planted at a depth of from three to six feet; and there was generally no produce for the first three years. During the second or third spring it was trained along a horizontal trellis of canes, *Arundo donax*

(grown in moist situations for that purpose), and this cane-work was supported by stakes at three or four feet from the ground. One advantage attending the cultivation of the vine was that the plant required little or no water in the height of summer, when that article was scarce, and when other plants needed all that could be obtained. It was usual to cultivate cabbages and other vegetables between the vines. In the north and other inferior situations, the vine was generally trained on chestnut-trees, as a less expensive mode of cultivation; and this was certainly more picturesque and pleasing to the eye than the stiff and formal trellis-work; the grape, however, was said to be richer when grown near the ground. In winter, when the vines were stripped of their leaves, the cane-work gave to the country the appearance of being covered by a vast net. Altogether, nearly forty kinds of grapes were used in making wine.

The vintage usually took place, in the south, in the early part of September; and, from a fortnight to three weeks later in the north, according to the exposure or elevation. The rats and lizards were said to destroy nearly one-fifth of the produce, and leaving the lower vineyards as the vintage ascended, made sad havoc among the last remaining fruit. The grapes, after having been *escolhidos* or picked, were thrown into the *lagar*, or wine-press, a large and clumsy wooden trough, where they were merrily

trodden by the bare feet of singing vintagers.* After the first juice had been drawn off, the remaining mass was collected together, and, a rope being coiled round it, a lever pressure was applied. The juice *(mosto)* was received in a tub, and conveyed in goat-skins to the stores, where it was emptied into casks for the purpose of fermentation, which usually lasted in an active state, for four or five weeks. After the juice had been extracted, a quantity of water was thrown into the press, and the refuse undergoing a repetition of the same process, produced *agoa pé*, foot-water, or dregs, a drink held in great estimation by the lower classes, though it frequently produced disagreeable consequences.

When the wine had ceased to ferment, it was drawn off the lees, and transferred to other casks, where it was clarified with eggs, ox-blood, or more frequently gypsum, a gallon or two of brandy having been previously added to each pipe to prevent the acetous fermentation taking place. The brandy used for this purpose was made on the island from the least valuable wines, such as those of Porto Santo and Saõ Vicente.

The inferior kinds of wine, after being clarified, were subjected, in stoves, to a temperature of from

* This rude mode of extracting the juice of the grape was practised at a very early period. The sculptures of Egypt represent the process, and there are passages in the Bible and in several Latin poets which shew that the ancient Hebrews and the people of Italy adopted it.

140° to 160° Fahr. for six months, by which process of forcing they assumed an apparent age; but, at the same time, a dry and smoky flavour was communicated, which could never be entirely eradicated. This class of wine was shipped annually, in large quantities, to Hamburg, where it underwent a process which changed its character to that of Hock, under which name a large portion of it is said to have found its way into the English market.

The wines produced along the southern coast of the island of Madeira were probably unequalled by those of any other country, whether in body, aroma, softness, or delicacy of flavour. The reason that the wines of Madeira have for many years past been gradually sinking in the favour of British consumers, in spite of these excellences, is, that under the stimulus of a large demand, and the temptation of the high prices which obtained during the wars with Napoleon, the merchants shipped wines of inferior quality. This proceeding in the end damaged the character of the whole produce, and excited an unfounded prejudice against first class wine. A similar cause is at work, according to Mr. Ford, in lowering the credit of sherry. "Formerly (says he) Madeira was the vinous panacea, until the increased demand induced disreputable traders to deteriorate the article, which in the reaction became dishon-

oured. Then sherry was resorted to as a more honest and wholesome beverage. Now its period of decline is hastening from the same causes, and the average produce is becoming inferior, to end in disrepute."

The following constituted the principal wines of the island; many others, however, were produced, but they were seldom met with out of the island, which indeed was the case with some of those we are about to mention.

Malmsey.—A light-coloured wine, made from the *Malvazia Candida*,* a large oval grape, of a rich gold-colour when ripe, hanging in long and rather thin bunches. The finest wines of this class were produced at the *Fazenda dos Padres*, formerly belonging to the Jesuits, and the *Païl do Mar*, both to the west of Funchal. By the growers it was considered a very unprofitable vine, the flower being so easily blighted that the produce was frequently little or nothing. For this reason, as well as on account of its very rich character, Malmsey was considered the most valuable of all the Madeira wines, and was usually charged from £75 to £85 per pipe on board, a price which is now much higher for the small remaining stock.

Bûal.—A soft and delicate wine, made from a

* Corrupted from Candia, from which island it was first introduced in 1445.

beautiful round straw-coloured grape, about the size of a small marble, which it was necessary to cut as soon as it ripened, otherwise it shrivelled up and yielded little juice. The wine is of a peculiarly delicate and rich character, and a splendid wine either new or old. The usual shipping price of Bûal was from £70 to 80 guineas per pipe.

Sercial.—A dry light-coloured wine, of strong aroma and high flavour, produced from the round *Hock-grape*, which hung in thickly-clustered bunches. This wine could not be used before it was eight years old. It was then considered by connoisseurs, the finest and most wholesome of all the wines of Maderia. The new wine was extremely unpleasant to the taste; and the grape itself was quite uneatable, so much so, that even the lizards would not touch it. Its price in Madeira varied from £70 to £80 per pipe.

Tinta, or Madeira Burgundy.—A dark-coloured and fine-flavoured wine, made from the small black Burgundy grape. It received its high claret colour from the husks of the grape, which were allowed to remain in the wine during the process of fermentation, and which imparted to it the astringent property of Port. Tinta was generally used during the first or second year; after that period it gradually lost its fine aroma and delicate flavour.

Its usual price was from £60 to £70 per pipe.

Madeira, the principal wine of the island, was made from a variety of grapes both dark and light-coloured, mixed together in the wine-press. When new it was generally of a light-claret colour, but this tint gradually disappeared as the wine advanced towards maturity, when it assumed a bright amber hue. The most esteemed Madeira was produced on that part of the island lying between Funchal and Campanario, particularly in the districts of Cama de Lobos and the Estreito. This wine is supposed to be much improved by a voyage to the East or West Indies, and is classed accordingly in the London market, as "East or West India Madeira"—that going direct to England being styled "London Particular." The usual shipping price was from £25 to £50, whilst at present it varies from £50 to £80 per pipe.

The wines of Madeira, with the exception of Tinta, should be kept in cellars of a moderate and equable temperature, and in a cold climate should be placed for a short time before being decanted at a moderate distance from the fire; the decanter being warmed in like manner.

The total quantity of wine annually produced on the island was never accurately known; it is supposed, however, that previous to the appearance of

the disease, the yearly production amounted to from twenty to twenty five thousand pipes, of which about one-third was exported; the remaining portion being either converted into brandy, or consumed on the island.

The average produce of the vine-growing land of the island was estimated at rather more than a pipe per acre. Four pipes per acre was about the maximum produce. The best soil for the vine was a mixture of red and yellow tufa, known locally as *saibro* and *pedra molle*; a decomposing basalt called *cascalha* was considered a good soil, but a stiff clayey soil was unsuitable. At a greater height than 1500 feet the grape was never properly matured, and though vines bore fruit in situations as high as 2000 feet, the wine was of a poor quality. A vineyard under ordinary circumstances was thought to require replanting about every twenty years. Much, however, depended upon the soil, and as much upon the system of cultivation; so that whilst the vines in a bad soil, and under a careless tenant, would not last more than eight or ten years, they would remain in good bearing condition under more favourable circumstances for fifty or sixty years. The export duty on wines shipped from Madeira amounts to 5530 Rs. (23s. 0½d.) per pipe of 92 imperial gallons.

The following table shews the exports of Madeira wine for the years indicated :—

Years.	Pipes.	Years.	Pipes.	Years.	Pipes.
1825.....	14,432	1844.....	7,054	1850.....	7,125
1830.....	5,499	1845.....	7,179	1851.....	7,961
1835.....	7,730	1846.....	8,190	1852.....	5,626
1840.....	7,975	1847.....	5,577	1853.....	3,241
1841.....	7,157	1848.....	5,829	1854.....	1,860
1842.....	6,270	1849.....	7,379	1855.....	2,085
1843.....	7,385				

It will be seen from this table that, previous to 1852, the first year of the disease, the average quantity exported was about 7000 pipes, a large proportion of which went to England. Whilst the home consumption in England had been gradually decreasing for some years, the demand in America and Russia was on the increase. In 1840, there were retained 112,555 gallons for home consumption in England; in 1849 only 71,100 gallons, and in 1854, no more than 42,874 gallons.

The stock of Madeira wine in bond in the United Kingdom on the 31st of March 1856 amounted to no more than 319 pipes, the total stock of wines from all countries amounting to 102,441 pipes.

CHAPTER XI.

METEOROLOGY.

Section I.

THE first section of this chapter embraces the results of a series of observations carefully made by Mr. White during 1850 and the first four months of 1851. It is believed that they afford the means of arriving at a fair estimate of the climate of Madeira, in those situations usually chosen for the summer and winter residence of invalids. During the former season, from June to September inclusive, the observations were made at the Quinta de Santa Anna, in the valley of Machico, at an elevation of only 421 feet above the level of the sea. The instruments were placed at the outside of a window, having a north aspect, about ten feet from the ground, and protected from all currents of air and reflected heat, by being placed within a double frame of lath-work, covered outwardly with white oil-cloth, and lined with flannel; the inner compartment having flannel outwardly, and

an interior lining of blue cloth. The two frames were separated about an inch from each other, allowing a current of air to pass freely between them, and forming together a box about eighteen inches square, with a sloping roof; one side being of perforated zinc, and the front completely open towards the window, on the sill of which it was secured: the window being closed half-an-hour previous to each observation.

The readings during the winter months were taken in a house situate in the Rua do Estudo, a central position in Funchal; and the same precautions were observed. The window stood at an elevation of 132 feet above the sea, and 35½ feet from the ground, with an aspect E.N.E. and perfectly open.

The receiver, or funnel of the rain-guage, was situated at an elevation of 148 feet above the sea, and 49 feet from the ground, free from all eddies or counter-currents, except those produced by the lofty hills sloping upwards towards the north.

The instruments, excepting the barometer, were made by Casella & Co. of Hatton-garden, London, and corresponded with each other.

TABLE I.—*Shewing the Mean Temperature for each day for Sixteen Months, from Observations taken at* 8 A.M., 2 P.M., *and* 6 P.M.

1850-51.	At FUNCHAL.					At MACHICO.				At FUNCHAL.						
Days of Month.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.
	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.
1	60.7	62.3	65.5	67.0	70.0	66.7	67.2	70.5	70.3	74.0	68.3	66.6	62.2	59 7	62.7	66.7
2	59.3	63.3	66.3	65.7	69.7	66.8	67.6	70.2	69.3	72.3	67.8	66.5	61.2	55.3	63.5	64.3
3	57 7	62.7	64.3	67.3	70.8	67.0	68.6	71.3	70.2	73.7	67.7	64.5	61.8	58.8	59.2	65.8
4	61.0	62.7	64.0	68.3	69 3	65.5	68.5	71.2	70.3	74.3	66.7	63.7	65.7	59.8	59.3	66.7
5	62.7	62.7	62.0	69.9	69.7	66.0	70.3	70.5	71.5	72.0	67.8	64.7	62.2	61.2	59.7	65.0
6	62.3	62.2	64.2	67.8	69.2	66.5	69.0	71.2	72.2	72 3	68.0	65.6	64.3	58.7	61.7	64.0
7	60.8	60.3	64.3	67.0	68.2	66.5	68.5	69.7	72.0	72.0	71.4	65.6	65.5	61.2	63.0	64.0
8	61.7	61.8	64.7	67.7	67.8	67.3	68.3	69.5	73.2	73.5	69.5	66.3	65.7	60.8	64.2	63.8
9	61.5	61.7	64.7	69.5	66.7	66.8	67.0	70.0	72.8	73.0	67.5	61.3	60.8	59.7	62.5	61.5
10	60.5	62.3	63.2	68.0	69.7	66.7	67.0	70.7	71.8	72.0	67.8	62.7	62.2	60.2	64.8	62.3
11	61.1	63.3	64.3	65.1	70.2	64.8	68.2	70.7	71.5	70.0	67.8	63.7	61.3	60.3	63.3	63.5
12	61.3	63.3	61.2	65 3	71.7	66.7	68.6	70.0	69.2	69.3	67.7	63.0	63.0	59.5	65.2	65.0
13	63.7	62.0	64.3	65.8	71.3	66.5	69.3	68.8	70.7	71.8	66.5	61.7	61.0	60.3	61.3	61.5
14	63.5	62.7	65.2	68.2	71.5	66.7	71.6	69 2	72.2	72.3	66.0	63.6	63.7	59.0	63.8	64.5
15	63.3	62.3	64.7	68.5	71.8	66.3	70.2	70.0	69.3	72 2	66.5	62.0	63.3	61.0	65.3	66.7
16	62.7	65.2	64.3	68.8	69.6	65.7	69.8	69.7	70.8	73.0	66.0	61.5	63.8	60.7	62.0	67.3
17	65.7	66.7	62.8	67.2	67.8	66.2	70.8	69.0	70.7	73.0	66.0	61.5	64.0	59.3	61.3	68.0
18	61.5	64.7	65.0	69.0	67.3	65.8	72.0	71 0	69.7	69.8	65.8	62 3	64.5	60.5	61.0	68.1
19	63.2	64.2	63.8	69.5	67.3	66.7	71.6	70 3	68.7	70.0	65.8	61.8	61.3	62.0	63.5	67.0
20	63.7	65.7	66.0	68.5	67.5	67 3	71.5	70.3	68 5	70.8	66.7	62.8	62.2	61.3	63.8	67.3
21	63.3	64 8	64 3	68.5	67.2	68.3	72.0	70.3	67.5	71.0	66.5	62.0	63.5	61.0	63.2	66.2
22	64.2	70.0	64 7	68.6	66.8	68.0	72 5	67.8	68.2	67.7	65.3	62,7	62.0	58.3	65.8	67.3
23	62.7	72.7	65.0	70 3	67.2	67.7	71.3	67.7	69.2	67.2	66.3	62.2	59.7	60.5	66 3	67.3
24	64.0	72.3	66.0	69.0	69.3	66.2	70.8	69.5	69.8	67.5	67.0	60.2	60.3	60.5	67.0	67.5
25	64.5	72.7	63.7	69.7	71.7	67.0	71.6	69 7	68.0	68.8	65.8	58.0	61.2	61.0	64.8	67.2
26	62.8	68.7	64.7	69.7	69.3	67.2	70.3	70.8	67.7	66 5	64 3	61.2	62.8	61.0	65.0	65 8
27	62.5	68.2	65.2	70.3	69.2	67 8	71 0	77.3	67 7	67.0	66.3	62.3	64.5	62.5	62 7	66.3
28	60.3	67.0	65.2	71.7	69.7	67.5	69.6	77.8	67 8	66.5	66.3	62 3	64.7	64.5	66.3	63.5
29	61.8	...	64.7	69.8	71.2	68.5	69 6	78.8	69.7	66 2	65.3	61.5	63.0	...	66.0	65.7
30	61.4	...	67.0	69.7	72.7	68.5	69.8	70.0	69.8	69.3	65.2	61.2	62.5	...	66.2	66 3
31	62.2	...	68.3	...	71.0	...	70.3	68.8	...	69.0	...	62.0	62.5	...	66.3	...
Mean...	62.18	64 94	64.63	68.35	69.43	66.84	69.82	70.71	70.01	70.58	66.85	62.80	62 78	60.31	63.57	65.54

TABLE II.—*Shewing the Daily Range of the Thermometer, for Sixteen Months, from Observations taken at* 8 A.M., 2 P.M., *and* 6 P.M.

1850-51.	At FUNCHAL.					At MACHICO.				At FUNCHAL.						
Days of Month.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.
	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.
1	3.0	5.0	5.5	3.0	9.0	4.0	1.0	4.5	6.0	3.0	4.0	3.0	6.0	2.0	4.0	6.0
2	9.0	5.0	4.0	6.0	1.0	5.0	3.5	3.5	2.5	4.0	6.5	6.5	3.5	5.0	8.5	5.0
3	7.0	5.0	3.0	6.5	4.0	7.0	4.0	4.5	3.5	4.5	7.5	6.5	7.5	10.0	5.0	5.0
4	6.0	5.0	6.0	3.0	7.0	4.5	4.0	4.5	4.5	2.0	4.0	6.0	7.0	9.0	3.5	5.0
5	10.0	5.0	5.0	4.0	7.0	4.0	5.0	4.0	3.5	5.0	3.5	7.0	7.0	9.5	6.5	5.0
6	10.0	11.0	5.5	6.5	7.5	2.5	3.0	2.5	4.5	4.0	7.0	1.0	6.0	8.0	4.0	5.0
7	10.5	8.0	6.0	6.5	9.5	3.5	4.5	4.5	4.0	5.0	5.5	3.0	5.5	9.5	6.0	8.5
8	9.0	10.5	9.0	9.0	5.0	4.0	4.0	3.5	5.5	2.0	8.0	5.0	8.0	7.5	5.5	6.5
9	6.0	6.0	9.0	3.5	5.0	3.5	3.0	5.0	4.5	3.5	4.5	1.0	7.0	8.0	8.0	8.0
10	10.0	4.0	8.0	6.0	9.0	4.0	3.0	6.0	7.0	8.0	4.0	9.0	5.5	9.5	6.5	9.0
11	10.0	5.0	4.5	11.0	8.5	5.5	2.0	5.0	5.0	8.0	3.5	8.0	9.0	7.0	5.5	4.0
12	8.0	7.0	3.5	5.0	6.0	4.0	2.0	4.5	4.0	2.5	7.0	4.0	6.0	5.0	6.5	7.0
13	5.0	5.0	7.0	5.5	5.0	4.0	2.0	2.5	5.5	4.0	4.5	7.0	7.0	5.0	3.0	5.5
14	7.0	8.0	3.0	7.5	6.5	5.0	4.0	3.0	4.5	2.5	8.0	9.0	3.0	6.5	5.5	6.5
15	9.0	6.0	9.0	5.0	8.5	3.0	2.5	3.0	6.5	3.5	3.5	9.0	7.0	8.0	6.0	7.5
16	6.0	5.5	5.5	1.5	2.0	1.0	1.5	4.0	3.5	1.5	9.0	5.5	6.0	9.0	3.0	7.0
17	7.0	2.5	4.5	6.5	4.5	3.5	1.5	3.0	5.0	6.5	9.5	4.5	4.0	2.5	5.0	5.0
18	8.0	6.0	3.0	9.0	4.0	2.0	1.0	5.5	4.5	3.5	9.0	6.0	7.5	7.5	3.5	8.0
19	7.0	8.5	6.5	8.5	4.0	2.5	4.0	4.0	4.5	5.0	9.0	4.0	3.0	8.0	5.0	6.0
20	7.0	5.0	6.0	7.5	4.5	3.0	3.0	5.0	1.5	5.0	8.0	7.5	3.5	7.5	5.0	5.0
21	9.0	7.5	7.0	6.0	3.5	4.0	3.0	4.0	3.5	5.5	6.0	4.0	6.0	6.0	4.5	6.0
22	7.5	6.0	6.0	8.0	5.5	3.5	1.5	5.5	5.5	5.0	7.5	4.0	6.5	9.0	9.5	3.5
23	6.0	3.0	6.0	10.0	5.0	4.0	3.0	2.0	5.0	4.5	6.0	3.5	8.5	5.5	3.0	4.0
24	4.0	1.0	6.0	7.0	4.5	2.5	2.0	3.5	4.0	4.5	7.5	3.5	8.0	9.5	6.0	2.5
25	3.0	2.0	4.0	6.0	9.0	2.0	2.0	3.0	5.0	4.5	6.5	4.0	6.5	6.0	4.5	4.5
26	5.0	6.0	6.0	5.0	4.0	2.5	3.0	6.0	4.0	1.5	5.0	5.5	8.0	5.5	8.0	7.0
27	5.0	6.0	6.0	10.0	3.0	2.5	2.5	5.0	2.0	2.0	5.0	9.0	9.0	7.5	8.0	3.0
28	7.0	5.5	5.5	6.0	4.0	3.5	3.5	3.5	2.0	1.5	6.0	4.0	7.0	9.5	8.0	6.0
29	5.5	...	5.0	2.5	4.0	3.5	3.5	3.5	2.5	3.5	8.5	9.5	5.0	...	5.5	2.5
30	7.0	...	5.0	8.0	4.0	3.5	3.0	4.0	3.5	6.5	5.5	8.5	5.5	...	6.5	5.5
31	6.0	...	6.0	...	6.0	...	3.5	2.5	...	6.5	...	4.5	7.0	...	4.0	...
Mean...	7.08	5.71	5.67	6.31	5.48	3.54	2.87	4.01	4.23	4.14	6.30	5.56	6.33	7.01	5.58	5.63

In Table I. the mean daily temperature of February 1850, is increased 1°08 by a *Leste* of four days' duration; and that of August, 0°84, by three days *Leste*. On these occasions the highest temperature observed during the day, by self-registering thermometers, was as follows:—

At FUNCHAL. 132 feet above the sea.		At MACHICO. 421 feet above the Sea.		At St. A. DA SERRA, (Quinta das Amexieiras.) 1910 feet above the sea.	
1850,	deg.	1850,	deg.	1850,	deg.
February 22	75.0	August 27	81.0	August 27	84.0
„ 23	77.0	„ 28	83.0	„ 28	91.0
„ 24	74.0	„ 29	77.5	„ 29	80.0
„ 25	76.0				

TABLE III.—*Shewing the Highest and Lowest Temperature, observed at the hours noted, exclusive of Leste, during each month; and the Monthly Mean of each hour, deduced from daily observations.*

1850-51.	8 A.M.			2 P.M.			6 P.M.			10 P.M.			Date of Leste.	Locality.
Months.	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.[2]	Mean.		
	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.		
January ..	64.0	54.0	58.72	70.0	61.0	66.13	64.0	58.0	61.69	60.0	53.0	57.46		Funchal. Machico. Funchal.
February .	66.0	55.5	60.73	72.0	65.0	66.89	68.5	58.0	63.68	63.0	55.0	58.37	4	
March	67.5	59.0	62.00	73.0	64.0	67.54	69.5	62.0	64.35	64.0	56.0	59.67		
April	69.0	57.0	65.00	75.0	68.0	71.31	71.0	61.0	68.75	66.0	61.0	64.56		
May	70.0	64.0	66.30	75.0	68.5	71.77	74.0	67.0	70.22	70.0	60 5	65.20		
June	68.0	64.0	66.38	71.0	67.0	68.78	68.0	62.0	65.38	67.0	63.0	64.33		
July	72.0	67.0	69.32	74.0	67.5	71.45	72.0	65.5	68.69	69.0	65.0	66.98		
August ...	72.0	67.0	69.50	74.5	67.0	71.92	69.5	65.5	68.19	68.5	66.0	67.22	3	
September	72.5	65.0	69.08	76.5	67.0	72.26	71.0	66.0	68.60	69.0	62.0	66.78		
October ...	73.0	64.0	68.77	76 5	68.0	72.74	74 5	65.0	70.24	72.5	63.0	67.51		
November	68.5	61.0	63.93	74.0	67.0	70.16	72.0	64.0	66.46	66.0	61.0	63.71		
December	65.0	56.0	60.37	70.5	60.0	65.67	67.0	58.0	62.38	67.5	56.0	60.11		
MEAN OF YEAR			65.00	...	...	69.72	...	...	66.55	...	...	63.49	7	
January ..	63.0	55.5	59.90	70.0	63.0	66 21	65.0	59.0	62.24	63.0	56.0	59.38		Funchal.
February .	61.0	54.0	57.50	69.5	61.0	63.98	64.0	53.0	59.46	60.5	53.0	57.01		
March	65.0	56.5	61.27	71.0	61.5	66.74	67.0	58.0	62.71	62.5	55.0	58.96		
April	66.5	58.0	63.15	74.0	60.5	68.73	67.0	60 5	64.73	65.5	56.0	61.48		

TABLE IV.—*Shewing the Highest and Lowest Temperatures registered during each Month, with the Mean Maximum, Mean Minimum, and Mean Monthly Range, deduced from daily Observations, exclusive of "Leste."*

1850-51.	Self-Registering Thermometers.						
	Day.			Night.			Mean of Monthly Range.
Months.	Highest.	Lowest.	Mean Maximum of Day.	Highest.	Lowest.	Mean Minimum of Night.	
	deg.	deg.	deg.	deg.	deg.	deg.	deg.
January.....	70.0	63.0	66.76	59.0	51.0	55.25	11.51
February	72.0	65.0	67.08	59.0	53.0	55.20	11.88
March	74.0	63.0	68.66	60.5	52.5	56.60	12.06
April	76.5	69.0	73.00	64.5	55.5	60.00	13.00
May	77.0	69.5	73.00	66.0	56.5	61.67	11.33
June	72.5	68.0	69.93	65.0	60.0	62.45	7.48
July	75.0	69.0	72.32	68.0	61.0	65.71	6.61
August	76.0	70.0	73.26	67.5	64.0	66.32	6.94
September.....	78.0	69.5	73.33	67.5	63.0	65.16	8.17
October	78.0	69.5	74.61	70.0	61.0	64.56	10.05
November.....	74.5	69.0	70.98	64.0	58.5	61.03	9.95
December	71.5	63.5	66.58	65.5	54.5	58.45	8.13
Mean of Year			70.79	...	...	61.03	9.77
January.....	70.0	64.5	67.59	60.0	51.0	56.46	11.13
February	69.5	58.0	64.89	58.5	52.0	54.18	10.71
March	71.0	63.0	67.60	60.5	51.5	55.35	12.25
April	74.0	65.5	69.55	65.0	53.0	58.81	10.74

TABLE V.—*Shewing Table IV. with "Leste."*

1850.	Day.			Night.			Mean of Monthly Range.	Duration of Leste.
Months.	Highest.	Lowest.	Mean Maximum.	Highest.	Lowest.	Mean Minimum.		
	deg.	deg.	deg.	deg.	deg.	deg.	deg.	
February	77.0	74.0	68.30	69.0	57.0	56.25	12.05	4 days
August	83.0	74.5	74.00	73.0	72.0	66.90	7.10	3 „

TABLE VI.—*Mean Monthly Results of daily Hygrometrical Observations taken at the hours noted.*

1850.	Hours.	Dry-Bulb Thermometer.	Wet-Bulb Thermometer.	Difference.	Dew-Point.	Elastic Force of Vapour.	Weight of Vapour.	Quantity required for Saturation.	
		deg.	deg.	deg.	deg.	inches.	grains.	grains.	
June	9 A.M.	64.33	59.25	5.08	55.2	.435	5.258	1 820	Sant' Ant. da Serra.
	2 P.M.	64.92	59.16	5.76	54.5	.424	5.145	2.065	
	7 P.M.	58.75	56.42	2.33	54.3	.421	5.175	.817	
July	9 A.M	65.77	60.53	5.24	56.3	.451	5.454	1.927	
	3 P.M.	65.68	60.63	5.05	56.5	.455	5.491	1.890	
	7 P.M.	61.95	57.92	4.03	54.7	.427	5.212	1.345	
August	7 A.M.	65.19	58.92	6.27	53.9	.415	5.135	2.116	
	3 P.M.	67.20	61.02	6.18	56.1	.448	5.431	2.254	
	7 P.M.	63.04	57.52	5.52	53.1	.403	4.899	1.895	
September	8 A.M.	69.08	64.48	4.60	62 8	.566	6.662	1.473	Machico.
	2 P.M.	72.36	66.06	6.30	61.6	.543	6.362	2.644	
	6 P.M.	68.60	64 33	4.27	60.7	.526	6.242	1.798	
October	8 A.M.	68.77	63.48	5.29	59.2	.500	5.963	2.101	
	2 P.M.	72.74	65.86	6.88	60.9	.530	6.228	2.888	
	6 P.M.	70.24	64.62	5.62	60.7	.526	6.222	2.196	
November	8 A.M.	63.93	58.33	5.60	53.8	.414	5.033	1.958	
	2 P.M.	70.16	62.35	7.81	56.9	.461	5.511	2.907	
	6 P.M.	66.46	60.38	6.08	55.5	.439	5.306	2.227	
December	8 A.M.	60.37	55.87	4.50	52.3	.398	4.802	1.473	
	2 P.M.	65.67	59.01	6.66	53.7	.412	4.998	2.362	
	6 P.M.	62.38	59.93	5.45	52.6	.400	4.836	1.804	
1851.	8 A.M.	59.90	55.30	4.60	51.2	.379	4.629	1.575	Funchal.
January	2 P.M.	66.21	59.37	6.84	53.9	.415	5.027	2.441	
	6 P.M.	62.24	57.40	4.84	53.5	.409	4.997	1.599	
February	8 A.M.	57.50	53.32	4.18	54.6	.356	4.410	1.363	
	2 P.M.	63.98	57.70	6.28	52.6	.400	4.830	2 183	
	6 P.M.	59.46	55.10	4.36	51.2	.379	4.633	1.483	
March	8 A.M.	61.27	55.17	6.10	50.3	.365	4.453	1.998	
	2 P.M.	66.74	59.19	7.55	53.2	.415	4.899	2.698	
	6 P.M.	62.71	56.71	6.00	51.9	.397	4.727	2.001	
April	8 A.M.	63.15	57.78	5.37	53.5	.409	4.988	1.828	
	2 P.M.	68.73	61.80	6.93	56.2	.450	5.403	2.661	
	6 P.M.	64.73	59.76	4.97	55.8	.444	5.377	1 787	

The mean value of the wet and dry bulb thermometers, in the preceding table, for the months of June, July, and August, were kindly furnished by Dr. Lund, from a register kept at the *Quinta das Amexieiras*, near Santo Antonio da Serra, 1910 feet above the level of the sea.

The dew-point is deduced from the temperatures shewn by the wet and dry bulb thermometers, by the use of the Table of Factors, and the rule given in the " Greenwich Magnetical and Meteorological Observations, 1844."

The elastic force of vapour is taken from the table recommended by Sir John Herschel, in the " Admiralty Manual of Scientific Inquiry, 1849."

The column of *Weight of Vapour* shews the quantity, in grains, existing in a cubic foot of air; and the last column, the quantity, in grains, required to saturate the same space at the existing temperatures. These calculations have been made from tables given in Professor Daniel's work on Meteorology.

TABLE VII.—*Shewing the Mean Height and Extreme Range of the Barometer, during each Month; the number of Days on which Rain fell, with the quantity in Inches; and the comparative Force of the Winds, from daily observations.*

1850-51. Months.	Barometer. (Uncorrected.) Mean.	Extreme Range.	Pluviometer Days on which Rain fell.	Quantity in inches.	Comparative Force of Winds. 0	1	2	3	4	5	Total of Days.
January ...	...	...	3	1.655	10	9	7	3	2	...	31
February ..	...	...	1	.094	4	10	10	3	1	...	28
March	...	...	9	3.636	2	9	14	4	2	...	31
April	...	...	2	.840	5	5	13	6	1	...	30
May	30.00	0.33	5	1.775	4	10	11	6	...	...	31
June	29.49	0.22	6	.420	3	12	11	4	...	...	30
July	29 55	0.29	4	...	4	11	9	7	...	...	31
August ...	29.56	0.21	5	...	2	10	12	6	1	...	31
September	29.66	0.36	10	...	10	9	7	4	...	...	30
October ...	29.97	0.77	12	5.607	4	11	8	7	1	...	31
November	30.17	0.29	1	.090	8	8	9	1	...	...	30
December	30.11	0.70	8	6.877	4	8	7	7	4	1	31
MEAN	29.86	0 46	66	20.994	60	112	118	62	12	1	365
January ..r	30.20	0.72	3	1.529	9	10	8	4	...	...	31
February ..	30.02	0.75	12	5.355	10	7	2	5	3	1	28
March	30.25	0.33	0	...	7	14	7	3	...	...	31
April	29.93	0.72	10	3.800	6	12	5	5	2	...	30

The preceding Table shews the quantity of rain for Funchal only. The slight summer showers passing over the more elevated positions above Machico, are registered in the column of days on which rain fell, although the quantity was not ascertained. During the months of July, August, and September, there was no deposit in the rain gauge at Funchal.

The comparative force of the winds is registered by numbers; viz.—

0 denoting calm.	3 denoting fresh breeze.
1 „ light air.	4 „ strong or violent wind.
2 „ gentle breeze.	5 „ moderate gale.

TABLE VIII.—*Shewing the number of Days in each Month during which the different Winds prevailed.*

1850-51. Months.	N.	NN.E.	N.E.	E.N.E.	E.	E.S.E.	Leste.	S.E.	S.S.E.	S.	SS.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	Days.
January	5	...	7	2	6	5	...	...	...	...	...	1	1	1	...	3	...	31
February	...	...	4	2	11	6	4	...	...	1	...	...	...	...	...	...	...	28
March	6	1	4	...	...	...	...	...	...	1	1	...	...	3	2	10	3	31
April	4	...	8	...	1	...	...	1	...	...	...	1	1	3	3	7	1	30
May	2	...	4	1	2	...	...	...	...	...	1	1	2	6	1	4	7	31
June	10	2	12	1	...	...	...	...	...	...	...	...	...	...	...	1	4	30
July	4	2	15	4	...	1	...	...	...	...	...	...	...	1	...	3	1	31
August	5	9	12	...	...	1	3	...	...	...	...	...	...	...	...	...	1	31
September	5	3	6	1	...	1	...	...	...	...	...	1	1	2	...	6	4	30
October	7	5	6	2	...	1	...	...	...	...	1	1	2	...	2	2	2	31
November	4	2	8	3	6	2	...	4	...	...	...	...	...	...	1	...	...	30
December	6	2	12	1	1	...	...	...	...	1	2	2	...	2	1	1	...	31
MEAN	58	26	98	17	27	17	7	5	...	3	5	7	7	18	10	37	23	365
January	4	1	4	...	2	...	...	1	...	...	...	...	2	1	4	2	10	31
February	4	...	7	3	1	4	...	...	2	1	...	...	...	2	1	2	1	28
March	6	1	17	1	2	...	...	...	...	...	...	...	...	...	...	4	...	31
April	6	1	7	...	...	...	...	...	...	2	...	...	3	...	4	6	1	30

From the position of the basin of Funchal, open only towards the south, it is difficult to ascertain the true course of the winds; for the eddies or currents, caused by the vicinity of the mountains, render either a vane or anemometer of little use. The direction of the winds, in the preceding Table, has been registered from the "*carry*" of the lower

strata of clouds, or from the course of the country boats passing the Brazen-head. During the continuance of north and north-east winds a gentle back current, making itself felt as a westerly breeze, usually blows into the bay of Funchal, and this, even when a perfect gale is raging in the offing.

To the results above tabulated Mr. White appended the following general remarks.

Without advancing any pretensions to medical science, or to a knowledge of the physiological effects of climate, a residence of many years in Madeira, and a lengthened sojourn, in pursuit of health, among the most favoured localities of the South of Europe, enable the writer to add his testimony to the decided superiority of the climate of Madeira over all those he has visited. The purity of the atmosphere is neither impaired by smoke nor dust; cold winds and close sultry weather are little known, and an uninterrupted summer may be enjoyed without suffering from extremes of heat or cold, or a continuance of damp or wet weather. Moisture never appears in mists or fogs, except on the mountains; and dews, though profuse at certain seasons on the higher grounds, seldom fall in Funchal. The heavy rains usually occur during the early spring and autumn, leaving the air clear and exhilarating. During the latter part of September, or early in October, the winds prevail from the west or south-west, accompanied by frequent and

heavy showers. January, February, and March are the coldest months; during the two latter there is frequently snow on the hills for a few days together, but never descending below the level of 2,500 feet above the sea. The air in Funchal, however, although the thermometer may not denote a greater cold than 60° of Fahr., frequently feels chilly during the time the snow remains on the mountains, and precautions are then necessary, though the cold is never so severe as to confine the invalid to the house. In Madeira there is little twilight; so soon as the sun sinks beneath the horizon, night closes in. The length of day is nearly the same throughout the year. During the summer the sun sets, at the latest period, about seven o'clock, and in winter, about two hours and a half earlier; with the same difference in his appearance above the horizon.

The late Dr. Mason * appears to have detected a greater degree of moisture in the atmosphere around Funchal, than is shown by the tables of other observers. The situation where his observations were made is notoriously one of the least favourable for that purpose in the outskirts of Funchal; and this circumstance, together with the fact of his hygrometer being placed in a close room, between two windows, near an open tank, and

* See a Treatise on the Climate and Meteorology of Madeira, by the late J. A. Mason, M.D. J. Churchill, London. 1850.

surrounded with trellised vines and vegetation, independent of the acknowledged inclemency of the season during which they were made, will sufficiently account for the difference existing between his observations and those of other persons.*

Section II.

Since Mr. White's observations were made, other meteorologists have been at work, and there has accumulated a mass of valuable observations, the results of which the editor now presents in a tabulated form. In these tables have been combined the results obtained by previous observers; the whole being placed together in such a shape that the reader will be able to draw from them pretty accurate conclusions as to the nature of the climate of Madeira in its leading features.

* We may refer the reader who wishes to learn the real value of Dr. Mason's observations, and the relation of his own case to the sanative influence of the climate of Madeira, to Mr. J. M. Bloxam's published letter to Dr. Lund on "The Climate of the Island of Madeira"—1855. This pamphlet also contains a dissection of Dr. T. H. Burgess's book, "The Climate of Italy in relation to Pulmonary Consumption, with Remarks on the Influence of Foreign Climates upon Invalids."—Ed.

TABLE IX.

Shewing the mean Temperature of the Months at Funchal for the Years, and according to the Observers, mentioned below.

	A Kirwan.	B Gourlay.	C Bowdich.	D Hein. and R.	E Mason.	F Harcourt.	G Mac-Euen.	H White.	I White.	K Barral.	L Mitterm.	M Mitterm.	N Mitterm.	O Lund.	P Lund.	Q Lund.
January.	64.18	61.	62.3	59.71	60.24	58.4	61.7	62.18	62.78	60.9	62.23	63.17	60.26	...	60.0	59.9
February	64.3	62.	...	60.28	61.12	59 4	62.5	64.94	60.31	57.3	61.10	60.40	59.36	...	60.4	59.0
March ...	65.8	61.	...	61.86	63.43	59.3	63.5	64.63	63.57	59.4	62.56	62.24	61.34	...	61.1	60.5
April.....	65.5	64.	...	62.03	65.39	58.7	62.3	68.35	65 54	64.7	65.75	68.04	64.04	...	61.78	61.5
May.....	66.53	65.	...	63.44	67.97	...	65.3	69.43	...	...	...	...	...	...	64.46	64.6
June.....	69.74	66.	...	66.90	69.44	...	...	66.84	...	...	...	...	...	...	...	...
July.....	73.45	73.	...	70.04	71.68	...	...	69.82	...	...	...	...	...	...	...	...
August...	75.02	73.	...	71.88	72.78	...	...	70.71	...	...	...	...	...	...	...	...
Sept.	75.76	72.	...	71.28	72.16	...	...	70.01	...	72.0	...	...	...	...	...	...
October..	72.5	68.	71.5	66.76	69.49	...	...	70.58	...	68.0	...	...	...	...	68.4	...
Nov.	69.8	65.	66.7	63.96	65.45	63.6	...	66.85	...	66.0	...	...	...	65.5	63.6	...
Dec.	65.0	64.	63.8	61.44	64.25	61.5	63.7	62.80	...	61.8	64.25	60.62	...	61.5	59.2	...
Year...	68.91	66.16	...	64.96	66.95	...	...	65.91								

A. Kirwan's Calculations according to Bowdich.

B. The mean of Dr. Gourlay's Observations for 18 years, according to Bowdich; 400 feet, A. S.

C. Bowdich's Observations for October, November, and December 1823, and January 1824.

D. Drs. Heineken and Renton, 1826-31; max. and min. thermometers, 15 feet from ground, 89 feet A. S.

E. Dr. Mason, 1834-5; 250 feet, A. S.

F. Rev. W. V. Harcourt, 1847-8; 80 feet, A.S.

G. Mr. C. M'Euen, 1848-9; 280 feet, A. S., max. and min. thermometer.

H, I. Mr. White, 1850-51. (See TABLE I.)

K. Dr. Barral, 1852-3; 150 feet, A. S., max. and min. thermometer.

L, M, N. Dr. Mittermaier, 1852-3-4. Four observations daily, at 9 A. M., and 2, 6, and 9 P. M., for 1852 and first 4 months of 1853, at 80 feet, A. S.; for the remaining months at 317 feet, A. S. From observations on the springs of water at Funchal, Dr. Mittermaier inferred the annual mean to be 64°.04.

O, P, Q. Dr. Lund, 1854-5-6; 180 feet, A. S., max. and min. thermometer.

TABLE X.—*Shewing the Mean Temperature of the Seasons according to*

	Kaemtz.	Heineken & Renton.	Mason.	White.	Mean of the 4 preceding cols.
Winter (Dec. Jan. Feb.)	61.34	60.60	61.87	61.55	61.34
Spring (Mar. April May)	63.5	62.36	65.59	65.48	64.23
Summer (June July Aug.)	69.98	69.56	71.30	68.27	69.77
Autumn (Sept. Oct. Nov.)	67.64	67.30	69.63	65.48	67.36
Year	65.6	64.96	66.95	65.91	65.68

TABLE XI

Shewing the Extreme Range of the Months in the Years, and according to the Observers, hereunder mentioned. (*See the Notes appended to Table IX.*)

Months.	Hein. & R. 1826-31.	Mason. 1854-5.	Harcourt, 1847.	Harcourt, 1848.	M'Euen, 1849.	White, 1850.	White, 1851.	Barral, 1852.	Barral, 1853.	Mitterm. 1852.	Mitterm. 1853.	Mitterm. 1854.	Lund, 1855.	Lund 1856.
Jan.....	18	10	...	19	17.5	19	19.	....	24.0	16.50	22.25	23.76	10.6	16.
Feb.....	20	14	...	17	20	19	17.5	...	23.0	17.75	20.25	21.42	18.0	15.
March...	17	17.5	...	21	22	21.5	19.5	...	21.0	19.50	21.50	21.22	15.2	18.
April ...	17	17.	...	19	19	21.5	21.0	...	24.0	24.0	18.75	22.68	17.0	15.
May.....	19	16.5	...	...	24	20.5	...	...	21.0	...	...	...	16.0	18.
June ...	17	17	...	...	...	20.0	...	...	...	...	...	...	...	...
July.....	16	14	...	...	...	15.29	...	...	...	...	...	...	...	...
Aug.....	17	14	...	...	...	19.68	...	...	...	...	...	...	...	...
Sept.....	16	13	...	...	...	12.84	...	21	...	...	...	...	...	...
Oct.....	19	15	...	...	...	17.0	...	22	...	...	...	...	13.	...
Nov.....	19	16	16	... [M'Euen.]	...	16.0	...	21	...	...	...	[Lund.] 16.5	15.	...
Dec.....	19	17	18	15.5	...	13.0	...	22	...	20.50	25.2	11.6	18.	...

TABLE XII.—*Shewing the* MEAN DAILY RANGE *of the Months in the Years, and according to the Observers, hereunder mentioned. (See the Notes appended to Table IX.)*

	Heineken & R. 1826-31.	Mason, 1834-5.	Harcourt, 1847.	Harcourt, 1848.	White, 1850.	White, 1851.	Barral, 1852.	Barral, 1853.	Mitterm. 1852.	Mitterm. 1853.	Mitterm. 1854.	Lund, 1855.	Lund, 1856.
Jan.	9.15	5.97	...	9	11.51	11.12	...	14.0	10.8	11.9	12.78	6.0	6.3
Feb.	10.17	7 25	...	9	11.88	10.71	...	11.25	11.9	10.62	11.88	7.6	8.0
March	9.79	9.81	...	12	12.06	12.25	...	13.22	8.82	11.34	13.86	9.7	9 3
April	9.39	10.13	...	12	13.0	10.74	...	14.9	12.78	...	11.52	10.78	9.25
May	9.05	9.25	...	...	11.33	...	...	...	9.72	9.72	...	8.8	9.7
June	8.73	7.43	...	...	7.48	...	...	...	10.44	...	...	...	...
July	9.82	6.77	...	...	6.61	...	...	...	8.46	...	...	...	...
Aug.	10.05	8.29	...	...	6.94	...	...	...	...	...	...	...	...
Sept.	9.53	7.68	...	...	8.17	...	10.25	...	...	...	...	...	...
Oct.	10.56	7.13	...	...	10.05	...	11.16	...	...	...	...	6.3	...
											Lund.		
Nov.	10 76	6.50	10.	...	9.95	...	9.96	...	...	...	7.0	7.3	...
Dec.	10.48	5.09	9.	...	8.13	...	11.41	...	10.8	9.90	6.6	9.0	...

TABLE XIII.—*Shewing the Maxima and Minima of the Years, and according to the Observers, hereunder mentioned.*

Year and Observer.	Month.	Maximum of year.	Height above sea.	Minimum of year.	Month.
1834, Dr. Mason	June, July, August	80°	250 feet	53°.5	March
1849, M'Euen	...	...	280 feet	52°.5	March
1850, Mr. White	August	83°	432 feet	51°	Jan. (132 ft.)
1851, „	...	...	132 feet	51°	January
1852, Dr. Mittermaier	...	...	80 feet	51°.5	February
1853, „	...	...	80 feet	48°.75	February
1854, „	...	...	317 feet	46°.58	Dec. (1853)
1855, Dr. Lund	...	...	180 feet	52°	January
1856, „	...	...	180 feet	48°	January

Hygrometry.—"The autumnal rains," says Dr. Heineken, "commence generally towards the end of September, and terminate in December; they have more the character of violent and intermitting

showers, than incessant daily rains. The winter rains set in, and prevail more or less throughout January and February, and are far more decided and tropical. March and April are showery and windy; May fine, with a passing shower; and in June, July, August, and part of September, we seldom have a drop of rain. At the level of the city no perceptible dew is produced; but up the mountains it is profuse. As a general law, to which but few exceptions will arise, it may be said that our rains are periodical, and that they come from the westward of N. and S.; and that to the eastward of these points of the compass it is all fine open weather."

TABLE XIV.—*Shewing the Quantity of Rain (in inches and decimal parts) that fell in the Months and Years, and according to the Observers, hereunder mentioned.*

	Heineken, 1825.	Heineken, 1826.	Hein. & R., 1825-31	White, 1850.	White, 1851.	Barral, 1852.	Barral, 1853.	Land, 1854.	Land, 1855.	Land, 1856.
Jan.....	1.83	5.32	5.92	1.655	1.529	...	2.02	...	5.51	10.44
Feb....	1.79	0.0	1.46	0.094	5.355	...	11.59	...	7.22	3.19
March	2.32	3.72	2.21	3.636	0.0	...	2.15	...	1.13	13.47
April .	1.66	0.04	2.30	0.840	3.800	...	0 67	...	0.10	0.69
May ...	1.00	3.29	1.26	1.775	...	...	...	...	1.08	0.89
June...	1.05	0.02	0.73	0.420	...	...	...	...	0.0	
July...	0.72	0.77	0.26	0.0	...	...	...	...	0.0	
Aug....	1.62	0.0	0.46	0.0	...	...	...	...	0.0	
Sept...	2.56	1.41	0.92	0.0	...	...	...	...	1.33	
Oct.....	0.67	1.18	1.66	5.607	...	4.93	...	...	2.59	
Nov...	1.80	18.61	8.03	0.090	...	4.80	...	4.07	5.35	
Dec....	3.41	8.99	4.02	6.877	...	3.87	...	4 99	6.37	
Year	20.43	43.35	29.23	20.994	...	...	...	...	30.88	

TABLE XV.—*Shewing the Number of Days on which Rain fell in the Months and Years, and according to the Observers, hereunder mentioned.*

	Hein. & R. 1827-30.	Mason, 1834-5.	White, 1850.	White, 1851.	Barral, 1852.	Barral, 1853.	Mitterm. 1852.	Mitterm. 1853.	Mitterm. 1854.	Lund, 1855.	Lund, 1856.
January	13	14	3	3	...	6	5	6	6	...	19
February.....	5	9	1	12	...	14	8	12	8	...	12
March	6	8	9	0	...	6	20	6	6	...	19
April	9	10	2	10	...	6	9	5	10	...	6
May.....	3	2	5	...	...	...	12	4	2	...	1
June	2	6	6	...	...	...	3	3	...	...	...
July.....	1	7	4	...	...	...	4	1	...	...	...
August	1	3	5	...	...	...	1	2	...	...	...
September	4	5	10	...	...	...	16	2	...	...	...
October	6	10	12	...	12	...	13	6	...	9	...
November	11	18	1	...	7	...	8	13	...	16	...
December	5	10	8	...	12	...	14	23	...	12	...
Year.....	66.	102	66	...	...	...	113	95	...	...	...

Dr. Heberden states that the quantity of rain which fell in the seven years from 1747-53, amounted to 214.346 inches, which gives an annual mean of 30.62 inches. The quantity in 1747 was large; it amounted to 40.581. The year 1749 was a dry one, and the fall of rain was only 22.365 inches. According to the seven years' observations (1825-31) of Drs. Heineken and Renton, the mean annual fall is 29.23 inches, but the mean fall of 1825 and 1826 was 31.89 inches. Between the 18th October 1852 and 31st May 1853, there fell 27.85 inches, and between 1st December 1853 and 31st May 1854, there fell 14.5 inches (Dr. Mittermaier). In the six months, October 1855 to

March 1856, the guage registered 41.4 inches, a very unusual quantity, shewing the season to have been an exceptional one. In Johnston's Physical Atlas the yearly fall of rain is stated to be 29.82 inches; and the distribution of the annual quantity amongst the seasons is given in parts of 100, at 48 in winter, 17 in spring, 4 in summer, and 31 in autumn.

The following heavy falls of rain have been recorded :—

1823, Jan. 4,	in 5 hours,	0.96 inches.	Bowdich.
1826, Dec. 26,	„ 24 „	3.70 „	Dr. Heineken.
27,	„ 24 „	3.33 „	„
1853, Feb. 22,	„ 4 „	2.05 „	Dr. Mittermaier.
1854, Nov. 21,	„ 24 „	3.45 „	Dr. Lund.

Sir James Clark states the mean annual number of days on which rain falls at 70; Dr. Mittermaier found the mean of three years (1851-3) to be 94; the mean of the eight years in Table XV., for which the monthly series is complete, is 88.4 days. The winter of 1855-6 was unusually wet, and rain fell on 87 days, during the six months from October to March, during which period rain fell on 120 days at Falmouth, and on 115 days at Greenwich.

TABLE XVI.—*Shewing the percentage of Aqueous Vapour suspended in the Atmosphere* (Saturation = 100) *for the Months and in the Years hereunder indicated, calculated from the Data of the Observers named below.*

	A	B	C	D	E	F	G	H	I	J	K
Jan. ...	70	70.	...	73	...	75.2	73	71	...	76	74
Feb....	72	60.5	...	75	...	73.5	70	73	...	77	64
March	66	52.	...	69	...	69.1	80	68	...	73	71
April ..	65	69.	....	72	...	68.7	73	73	...	69	65
May...	78	64.	...	...	...	70.6	71	75	...	65	64
June ..	72	...	79	...	...	...	73	70	...	...	...
July ...	79	...	78	...	...	...	...	...	...	...	...
Aug....	83	...	73	...	...	...	...	...	...	...	...
Sept....	88	...	78	...	...	...	...	...	...	...	...
Oct....	84	...	74	...	71 3	...	...	...	...	66	...
Nov....	87	...	71	...	73.3	...	...	...	71.5	69	...
		(1848)									
Dec....	82	70.	75	...	75.2	....	74	...	70.	71	...

A. Dr. Heineken, 1826; one observation daily, at 10 A.M.

B. Mr. M'Euen, 1848-9; mean of two daily observations with the dry and wet bulb therm. at 9 A.M. and 9 P.M.

C, D. Mr. White, 1850-51; deduced from the mean of three daily observations at 9 A.M., 2 P.M., and 7 P.M. (See TABLE VI)

E, F. Dr. Barral, 1852-3; mean of three daily observations with the dry and wet bulb therm., at 7 A.M., 2 P.M., and 7 P.M.

G, H. Dr. Mittermaier, 1852-3; mean of four daily observations with the dry and wet bulb, at 9 A.M., 2 P.M., 6 P.M., and 9 P.M.

I, J. Dr. Lund, Nov. 1854 to May 1855; deduced from the mean of eight daily observations with the dry and wet bulb thermometers, at 8 A.M., 10 A.M., 12 NOON, 2 P.M., 4 P.M., 6 P.M., 8 P.M., and 10 P.M.

J, K. Dr. Lund, Oct. 1855 to May 1856; deduced from one daily observation with Daniel's hygrometer, at 9 A.M.

For the heights above the sea, of the places where the observations were taken, refer to the notes appended to TABLE IX.

Dr. Mason deduced the mean percentage of aqueous vapour for the seasons, from Dr. Heineken's observations, as follows:—Winter, 77; Spring, 72; Summer, 80; Autumn, 86.

Dr. Mason inferred the existence of a large amount of vapour in the air of Madeira from the luxuriance of the vegetation in spite of the heat and dryness of the summers; but this inference appears simply absurd, when we remember that

water is regularly brought from the mountains into the fields and gardens by an elaborate system of irrigation, and that if this were neglected, not a green leaf, nor a blade of grass would be left in the lower region of the south side at the end of autumn. As to the development of cryptogamic plants on articles out of use, Dr. Lister suggests that this may be owing as much to the increased temperature as to the increased vapour.

Comparing the climate of Funchal with that of Torquay, one of the best in England (Mr. E. Vivian's results being adopted), the account stands thus :—

	Torquay.	Funchal.
	deg.	deg.
Annual mean temperature .	50.3	66
Maximum temperature . .	76	83
Minimum temperature . .	27	46.5
Mean daily range . . .	9.9	9.2
Days of rain	155	88
Inches of rain . . .	27	30
Mean humidity . . . (Saturation=100.)	76	73

Atmospheric Pressure.—It has been observed that the barometer is highest with a N.E. wind, and lowest with a S.W. wind. When hourly observations were taken, it was found that the mercury, after reaching its maximum at 8 in the evening, sank gradually until 7 in the morning, and then rising slightly to a second maximum at 10 or 11, it again fell until it reached its maximum

at 4 in the afternoon. Throughout most of the series of barometrical observations taken by different persons, no attempt has been made to correct the readings for temperature, etc., and consequently much labour has been thrown away, as the results without such corrections are valueless, however excellent the instruments, or however careful the observers. Drs. Heineken, and Renton made a series of daily observations at 10 A.M., for six years, 1826 to 1831, the instrument being a mountain barometer by Newman, placed 89 feet above the sea. The readings were corrected for temperature, and the annual mean came out 30 inches. The monthly means are given in the table below. The mean height of the barometer at Madeira, at the level of the sea, according to Kaemtz, following the authority of Schouw and Poggendorff, is 30.125 inches not corrected for gravity, or 30.092 inches corrected for gravity. He states the mean daily variation of the mercury throughout the year to be 0.410 inches; in winter 0.550 inches; in summer 0.245 inches. In October 1855, Dr. Lund commenced a series of observations with one of Newman's iron cistern barometers, mounted in brass, the index error having been determined by reference to the standard at the Royal Observatory, Greenwich. Dr. Lund's readings are the result of one observation daily at 9 A.M. The readings were corrected for capacity, etc., as well

as for temperature and for elevation, and they are to be taken as if obtained at the level of the sea, and at the temp. of 32° Fahr. The monthly means are given in the following Table.

TABLE XVII.—*Shewing the Mean Monthly Height of the Barometer at Funchal, in inches and decimal parts, according to the Observers hereunder mentioned.*

Months.	Hein. and Renton, 1826-31.	Dr. Lund, 1856.
January	29.91	29.955
February	30.05	30.172
March	29.98	29.965
April	29.91	30.159
May	30.00	30.167
June	30.06	
July	30.07	
August	30.01	
September	30.01	(1855.)
October	29.97	30.142
November	29.87	30.034
December	30.03	30.018
Mean of year	30.00	

Winds.—"During the greater part of the year," says Dr. Heineken,* "we have a sea and land breeze morning and evening; and with this exception it is rare that the wind changes more than once during the four and twenty hours. For weeks, sometimes almost for months without intermission, it will come from the N., NE., and E., and then we have our finest weather. To the S. of E. we look for a sirocco, and if it lingers at the S. or passes to the W. of it, heavy rain

* Phil. Magazine, November 1827.

invariably follows, and continues as long as it remains in that quarter. To the N. of W. it becomes more violent, and always attended with cold, squally weather; and in the winter, with snow on the summits of the mountains, and most of the little thunder and lightning which occur here. Reaching the E. of N., it becomes again fine. I never remember a week's sunshine when the wind had passed from the W. to the N.E. by the S.

The first line of the following table shews the number of days in the year 1826 on which the different winds were blowing. The second line exhibits the percentage of the winds calculated from a large number of observations made by Dr. Heineken in 1827 and 1828 :—

TABLE XVIII.

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
Heineken, 1826	21	157	56	20	2	7	74	29
Heineken, 1827-8	11.3	44.4	9.5	3.6	0.7	2.1	20.6	7.8

The great difficulty of ascertaining the true course of the winds at Funchal, by reason of the formation of the island, has already been noticed. Dr. Mason states that he had frequently seen three currents of wind affecting the clouds at the same time, whilst the vane indicated a fourth.

The NE. trade winds are first palpably felt in winter a few degrees south of Madeira. At

Funchal the south and west winds sometimes blow for a few hours with great violence; but the lofty chain of mountains in the centre of the island affords an effectual protection against the northern winds.

With regard to the dry, warm, east wind, locally known as *Leste*;—this very rarely makes itself felt during the winter and spring months, and therefore any advice to invalids as to removing to another climate in case this wind agrees with them, has little practical value. It is to be observed that Dr. Mason, who recommends those persons to remain with whom this wind materially disagrees, informs us that on one occasion he suffered very severely from the leste, and that on another his spirits were much exhilarated by it, and that he felt such a general alacrity and vigour about the whole system as he never experienced under any other circumstances. It is in summer that the full severity of the Madeira Sirocco, as it is sometimes called, is felt; and it is noticeable that its heat is more oppressive on the mountains than near the shore. Birds and insects are sometimes brought by it from Africa; and it is stated that a reddish dust has been occasionally deposited during violent lestes, in sufficient quantities to be collected by the hand.* The highest reading of the thermo-

* Instances of the fall of fine dust in the Atlantic Ocean are numerous and well authenticated. Dr. Mason states that in

meter during Dr. Mason's observations was 87°; but Dr. Renton once noticed the mercury at 93°. The maximum difference between the dry and wet bulb thermometers observed by Dr. Mason during a leste was 22.°5.

The general characteristics of the leste have been well described by Dr. Heineken in the Philosophical Magazine in the following words:—

"I am ignorant why the sirocco here is so perfectly dry, and that of the Mediterranean so loaded with moisture. It reaches us immediately from the coast of Africa, after passing over about 300 miles of sea. Not a cloud is to be seen during its continuance; the whole atmosphere is of one uniform unvaried blue, of a peculiar character, as though viewed through what a painter would term a very thin, warm, aerial haze. It blows from the E.S.E., lasts almost invariably three days, and encounters you like the puffs from the mouth of an

November 1834, during the occurrence of a *leste*, he observed the furniture covered with an impalpable reddish powder; and that at the same date, a vessel, which was 180 miles from Madeira, had her rigging and deck covered by an impalpable red sand to such an extent that it was necessary to clear away the annoyance. The shipping in Funchal harbour was also covered with the same fine powder. When Ehrenberg examined with his microscope some dust which fell at sea near the Cape Verde Islands, it was found to contain innumerable siliceous coatings of Infusoria. But as much doubt has been thrown on many of Ehrenberg's observations, it might be well to collect some of the dust whenever an opportunity occurs, and submit it to the examination of another microscopist. Mr. Darwin attributes the dust which is constantly falling near the Cape Verde Islands, to the wear and tear of volcanic rocks on the coast of Africa.

oven or furnace. The eyes and lips feel much as they do when exposed to a keen easterly wind on a frosty day in a northern climate. Birds and insects seem to suffer from it more or less, and fowls confined in a close yard invariably droop. Furniture warps and cracks; books gape as they do when exposed to a fire, and it is generally inconvenient and oppressive; but I have never heard (although no precautions are taken to avoid it by the labouring classes) that any ill effects have been produced by it."

The following Table has been compiled with the view of affording the means of comparing the temperature of Madeira with that of various other places to which invalids are in the habit of resorting. Our chief authority has been Sir James Clark's excellent work on the Sanative Influence of Climate, which contains so much trustworthy information and valuable advice, that it ought to be made the invalid's travelling companion. The temperature of Madeira for 1850 is derived from the observations taken at Funchal during the winter, and at the Quinta da Sant' Anna, above Machico, during the months of June, July, August, and September, as shewn in Table I. During these months the temperature of Funchal is higher by some degrees. The monthly temperatures for Funchal given in the preceding line are derived from the observations of Drs. Heineken and Renton, during a period of six years, as already given in Table IX.

TABLE XIX.—*Shewing the mean Temperature of various Places for the whole Year, and for each Month.*

PLACES.	Year.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October	Novem.	Decem.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
London	50.39	37.36	40.44	42.64	48.00	55.64	60.00	63.43	63.52	58.80	51.78	43.47	39.58
Clifton	51.26	38.87	39.25	43.62	49.50	56.25	63.50	64.25	63.87	58.62	50.87	45.00	41.62
Undercliff	51.35	41.46	40.58	44.14	49.57	54.27	59.47	60.20	62.24	59.59	52.80	48.35	43.63
Penzance	51.80	42.50	43.50	46.40	48.50	54.00	58.50	61.20	60.90	57.60	53.70	48.80	46.10
Cove of Cork	51.93	43.30	44.45	46.13	49.06	55.34	59.97	61.76	62.36	57.00	52.03	47.01	44.84
Torquay	52 12	43.60	41.90	45.15	50.90	54.20	61.15	61.75	60.90	57.35	53.05	48.95	46.65
Jersey	53.06	41.58	44.62	45.75	50.09	57.08	61.31	63.50	63.72	59.82	55.65	48.42	45.27
Pau	56.18	41.20	43.60	48.80	51.80	61.60	68.20	70.60	73.40	67.40	58.20	46.60	42.80
Florence	59.00	41.00	45.00	48.00	56.00	64.00	69.00	77.00	76.00	70.00	59.00	53.00	47.00
Nice	59.48	45.81	49.00	51.45	57.00	63.00	69.00	73.50	74.30	69.35	61.85	53.70	48.60
Pisa	60.60	44.00	48.11	51.52	56.30	63.75	70.50	77.50	77.50	73.50	62.62	52.30	47.00
Rome	60.70	47.65	49.45	52.05	56.40	64.50	69.17	73.30	74.02	69.50	63.60	58.80	49.62
Naples	61.40	46.50	48.50	52.00	57.00	65.50	71.00	75.00	76.50	72.50	65.00	54.50	50.50
St. Michael's, Azores	62.40	59.00	59.00	59.50	61.00	63.00	67.00	68.00	70.00	68.00	63.00	56.00	55.60
Palermo	63.50	52.50	52.00	54.50	58.70	64.80	71.60	76.10	76.60	72.80	67.30	60.40	54.90
Funchal	64 96	59.71	60.28	61.86	62.03	63.44	66.90	70.04	71.88	71.28	66.76	63.96	61.44
Madeira (1850)	65.91	61.00	61.14	62.63	66.50	67.33	66.19	69.01	69.79	69.24	69.58	66.00	62.51
Malaga	66.07	55.43	56.03	59.06	62.20	65.80	74.73	77.73	78.02	74.70	70.57	61.93	56.63
Malta	67.30	56.50	56.30	58.10	61.80	67.40	73.80	79.60	81.20	77.80	71.10	64 20	59.60
Sta. Cruz, Teneriffe	70.94	63.84	64.29	67.17	67.32	72.12	73.89	77.27	78.89	77.43	74.66	70.43	65.82
Cairo	72.17	58.10	56.12	64.58	77.90	78.26	83.66	85.82	85.82	79.16	72.32	62.96	61.34

CHAPTER XII.

THE CLIMATE AND ITS EFFECTS ON PULMONARY DISEASES.

THE following remarks as to the salubrity of the climate of Madeira, a subject upon which much has been ignorantly stated, were written by Dr. Tibbetts, a medical gentleman, no longer resident in the island, who placed them at the disposal of the author.

The result of all the observations obtained by Sir James Clark on the climate of Madeira, and the other foreign resorts of English invalids, is in his own words,—"Madeira is warmer during the winter, and cooler during the summer; there is less difference between the temperature of the day and that of the night, between one season and another, and between successive days: it is almost exempt from keen, cold winds; and enjoys a general steadiness of weather, to which the continental climates are strangers."

Such a climate ought to be a healthy one, and

the experience of many who have tried it, and of many who are now trying it, as well as the testimony of Englishmen who have been settled here in business during many years, will bear out the conclusion.

There are no diseases that can be said to be peculiar to Madeira; and although the inhabitants are subject to many of those common to more northern latitudes, these, in general, assume a mild form. One or two diseases of the skin, however, that are not met with in England, but are common in warm climates, are seen in Madeira;—such are Elephantiasis and Lepra, of which loathsome diseases the hospital of Saõ Lazaro contains many cases, and it is not difficult to discover their origin in the poor living and destitution among the lower classes, and the neglect of cleanliness in their persons and habitations, combined with the warmth of the climate.

A fact well known to medical men, and to most of the English residents who have reared families in the island, is the remarkable exemption enjoyed here from most of the complaints to which children are exposed in England during the early years of life, and the ease with which infants get over the period of teething—a time of great anxiety to mothers in general. Yet there is no doubt that the alternations of temperature in such a climate as that of England have a bracing effect, and

children who are originally of healthy constitution, and brought up there, are more robust in after life.

Zymotic diseases, as they are called (measles, scarlatina, etc.), are seldom met with in Madeira; and when an epidemic of any of these does occur, the disease appears in a much milder form than we generally see in England.

During one season, a few years ago, the small-pox proved extensively fatal among the natives, but its introduction was clearly traced to the crew of a vessel from abroad, and occurred also at a time when the sanitary regulations of the port did not exist, or were carelessly enforced.

Inflammatory fever is seldom met with, but a mixed fever, of a typhoid type, frequently makes its appearance toward the end of the summer; it occurs only in detached cases, and appears to possess nothing of a contagious nature, but not unfrequently proves fatal. Inflammatory affections of the bowels are not uncommon among the lower classes, caused chiefly, as Dr. Gourlay long ago remarked, by the poor people, when overheated and fatigued by their incredibly laborious occupations, imprudently drinking copiously of cold water.

Dysentery, a disease so fatal in tropical climates, is unknown in the severe form familiar to our medical practitioners in the East and West Indies;

nevertheless, at certain seasons, it has proved fatal, and especially during a season of scarcity of provision that occurred in 1847, the disease cut off many among the ill-fed and ill-clothed poor.*

A mild *Diarrhœa* occasionally annoys the stranger on his arrival from a cold climate, but this is not in any way peculiar to Madeira, as it is well known that the traveller is liable to be subjected to the same complaint on first taking up his residence in any part of southern Europe, or even in any of the continental towns. This may be the consequence simply of change from the mode of living on board ship to that on shore, combined with the increased temperature, or the result of imprudence; but it certainly is not the lot of every stranger on his arrival here. Dr. Watson, speaking of this kind of Diarrhœa, in his "Lectures on the Practice of Physic," says, "An article of diet which is perfectly wholesome and digestible, and which the stomach bears well after a little habit, will sometimes cause griping and purging, when it is taken for the first time."

The stranger in vigorous health, and the con-

* Old chronicles relate that from 1521 to 1538, some sort of plague (*peste*) visited Madeira. But the cholera had never been known there until the summer of 1856, when it suddenly broke out immediately after the arrival of some soldiers from Lisbon, and carried off several thousands in the space of a few weeks. The yellow fever is unknown, and goître, so common in many mountainous countries, never occurs.—*Ed.*

sumptive invalid are alike subject to this kind of Diarrhœa, which, it must be remembered, is a very different thing from that morbid relaxation of the bowels to which many of the latter class of visitors are liable at a certain stage of their complaint.

Acute rheumatic affections, with their usual and dangerous concomitant, disease of the heart, are very uncommon in Madeira, and chronic rheumatism, which so often cripples and disfigures the sufferer in England and other northern countries, is almost unknown. The greatest benefit is derived from a short residence here by patients labouring under the latter form of rheumatism.

The sedentary habits of the better class of the Portuguese render them very liable to hemorrhoids, as well as nervous dyspeptic complaints.

Although the climate of Madeira is very equable, it is not altogether free from changes, which constitute here, as well as elsewhere, the exciting cause of pulmonary and inflammatory affections. These, however, as may be supposed, are comparatively rare among the better classes, and occur chiefly among the hard-working poor, who are more exposed to changes of temperature, and are often liable to sudden chills of the surface while perspiring profusely. An epidemic catarrh not unfrequently makes its appearance about the months of August and September, or before the annual rains, which usually occur in October.

It is now pretty well understood that no climate affords entire exemption from scrofulous diseases. Whenever the exciting causes are applied, in whatever part of the world, these diseases manifest themselves. Pulmonary consumption is connected with what is called the scrofulous diathesis, and occurs among the natives of Madeira, but prevails much less among them than it does among the natives of more changeable climates. That it should occur is not to be wondered at, when we find many of the causes of the scrofulous diathesis in full operation among a large proportion of them. These causes are chiefly insufficient food and clothing in childhood and youth, and an inadequate supply of fresh air in their low, damp dwellings, combined with over-exertion. It should also be remembered that the natives of Madeira *must* be subject to consumption when the exciting causes are applied, for a reason given by Dr. Alison, who, speaking of the natives of warm climates, shews that the long-continued applications of heat in early life are weakening, and therefore favourable to the formation of the scrofulous habit; and it is found by experience that they are (both white and black) peculiarly liable to scrofulous diseases when they come to colder climates.*

* From an examination of the Register of Burials at the principal cemetery, Dr. Mittermaier calculated the mean duration of life of the native population of Funchal at 35.16 years.—*Ed.*

Dr. Fothergill, who wrote so far back as 1775, and Dr. Gourlay, in 1811, both adduced proofs of the mildness and equability of the climate of Madeira, and its beneficial effects on pulmonary diseases. Till the late Dr. Renton, however, brought the subject before the medical profession, in a paper published in the *Edinburgh Medical and Surgical Journal* in 1817, its advantages were not generally known in England. The observations of Dr. Heineken, published in the *Medical Repository* in 1824, have placed Madeira, as a winter resort for invalids, above any other spot in the northern hemisphere. That the climate of Madeira can prolong life, even under very unfavourable circumstances, the case of Dr. Heineken will afford a sufficient proof. This gentleman repaired to Madeira in 1820, when his case was pronounced by some of the most acute physicians in Britain to be rapidly approaching to a fatal termination; nevertheless, he managed to live in comparative comfort for nine years. His death was ultimately occasioned by exposure while returning from the adjacent island of Porto Santo in an open boat. A storm arose during the passage, from the effects of which he rapidly sank, and died within a few days after his return to Funchal. Dr. Renton, who, at his request, performed the autopsy, expressed himself astonished how he could have sustained life with so small a portion of his respiratory organs, there being scarcely a

vestige of one lung remaining, and the other was in a condition which would not have allowed him to exist in England.

"The mean annual temperature of Funchal," (says Sir James Clark) "is 64°, being about 5° only above that of the Italian and Provençal climates. This very moderate mean temperature, relatively to its low latitude, arises, however, from the circumstance of the summer at Madeira being proportionally cool; for, whilst the *winter* is 20° warmer than at London, the *summer* is only 7° warmer; and whilst the winter is 12° warmer than Italy or Provence, the summer is nearly 5° *cooler*. The mean annual range of temperature is only 14°, being less than half the range of Rome, Pisa, Naples, and Nice. The heat is also distributed throughout the year with surprising equality, so that the mean difference of the temperature of successive months is only 2°.21; this at Rome is 4°.39, at Nice 4°.74, at Pisa 5°.75, and at Naples 5°.08. When we take into consideration the mildness of the winter, and the coolness of the summer, together with the remarkable equality of the temperature during the day and night, as well as throughout the year, we may safely conclude that the climate of Madeira is the finest in the northern hemisphere. There is no occasion for a person throughout the winter in Funchal, to breathe, night or day, within doors,

an atmosphere below the temperature of 64°; or in the country, during the summer, at such a height as to ensure dryness, above that of 74°."

The following remarks have been contributed by Dr. Lund, whose experience as a physician entitles his opinion, in cases of chest disease, to great respect.

Consumption has long been known as one of the most fatal diseases occurring in Great Britain, and this great and well-known fatality is plainly shewn in the following extract from Banfield's *Statistical Companion for* 1850:—"The reports of the Registrar-General shew that in one year, in England and Wales, 59,025 died from consumption, being 18.2 per cent., or nearly one-fifth of the entire mortality.*

Sir James Clark, from collecting the observations of different standard authorities, estimates the ordinary duration of this disease to be from nine months to two years: that is, from the first consumptive symptom being observed until the disease ends fatally, all its different stages are passed through in this short period.

We also find in *The First Medical Report of the*

* The mean annual number of deaths from consumption in England and Wales during the three years ending 1854 was 52,265, whilst the deaths from all causes amounted to 422,045. The deaths from consumption were consequently about 12.3 per cent, or rather more than one eighth of the entire mortality.—*Ed.*

Brompton Hospital for Consumption, that out of 215 cases there occurred within one year 89 deaths; within 18 months 123; and within 30 months as many as 168 out of 215; leaving alive at the end of that period the small number of 47.

In the midst of such calamitous results a cheering gleam of hope broke forth, when, during the endeavours of different medical observers to ascertain the cause of death in various diseases, it was found that consumptive disease had existed where it had not been suspected, and that nature had been busily occupied in making efforts towards a cure, and this, too, under unfavourable circumstances. These observations, though few in number, being well authenticated, established the fact, that consumption was not always fatal; and further experience has fully proved that persons coming, for various periods of time, to such a climate as Madeira in the early, or occasionally in the advanced stages of the disease, have their complaints arrested when they have the prudence to conjoin proper regimen and treatment with the effects of climate. In all stages the most distressing symptoms are, almost invariably, so much ameliorated as to cause comparatively little inconvenience, and where this relief does not occur, the case is an exception to the general rule. Even in the most advanced stages the downward progress of the disease is much retarded, all the distressing symptoms ameliorated,

and the patient has the great advantage of freely inhaling a balmy atmosphere out of doors, which gives much relief. The great majority are thus enabled to pass with comfort their remaining term of life, and can generally take out-of-door exercise, or sit in a garden, until a day or two before finally sinking.

This affords a great contrast to what the invalid suffers at home, where, being necessarily confined within doors, and deprived of many enjoyments, he passes through a long and dreary winter in an artificially-heated and vitiated atmosphere—no mode of warming apartments being ever free from an oppressive closeness, which is not felt in the open air. Persons in England may delude themselves into the idea that it is possible to make an artificial Madeira climate, but they may rely upon it that they are mistaken. No means as yet discovered can compensate for a natural, mild, and pure atmosphere, affording opportunities of regular daily exercise.

The want of this in England, during the winter and spring months, necessarily prevents patients from deriving the full benefit from any plan of treatment, however well devised and adapted to the individual case; for I am fully convinced that without the aid of climate the most efficient part of the treatment is wanting. This applies especially to patients taking cod-liver oil; daily exercise and free

exposure to the air being absolutely necessary to insure its full beneficial effects. The diseased livers of the Strasburg geese, so highly prized by gourmands, are produced by "want of exercise, a warm close cage, and a due supply of fatty matter." The fact of two of the Assistant Physicians to the Hospital for Consumption at Brompton having come to Madeira, when invalided, shews that medical men in their own cases fully appreciate the advantages of a warm natural climate.

In order to illustrate as correctly as possible the effects of the climate of Madeira on consumptive disease I arranged a hundred cases from my note book, as nearly as possible in the order in which they were entered. The results were given in a tabulated form in the first edition of this work. but it has been thought undesirable to reprint them in that shape. I may however state that a patient coming to Madeira in the early stage of his complaint was shewn to have a very fair chance of having the disease permanently arrested, or, if more advanced, of gaining a prolongation of life, with the avoidance of many distressing symptoms. The cases coming to Madeira in the more advanced stage were composed of those who had tried other places, and came here as a last resource. There were other cases not included amongst those to which I have referred that had been sent out as *hopeless cases*, and yet lived in Madeira for many

years in the possession of health sufficiently good to allow them free indulgence in all prudent enjoyments.

So far Dr. Lund; let us now hear what Dr. Mittermaier, a German physician, at present residing at Heidelberg, has to say. He assiduously studied the climate of Madeira *on the spot*, from a medical point of view, for three winters and one summer, and he thus sums up the unbiassed result of his investigations :—

In regard to *equability of temperature*, Madeira stands before any other place; and although its climate is of the damp section, it is by no means to be considered excessively damp.

The *purity of the atmosphere*, and its *freedom from dust*, give it a great advantage over many other places, such as Egypt, Malta, Naples, Nice, and Malaga. Moreover, the island is altogether free from *miasmata*.

Another advantage which Madeira possesses is that the invalid may reside on the island the whole year, there being no necessity for him to make a long removal in search of a cooler atmosphere, as in other places.

A stranger will meet with more comforts and conveniences in Madeira than at any place in the south of Europe.

Lastly, it is my opinion, that Madeira offers in combination the chief climatal conditions which

are indispensably necessary to the recovery of invalids. Notwithstanding what I have said, the question still remains unsolved, whether the best possible place of resort for invalids has yet been discovered; for perhaps even a better place than Madeira may be found. In the meantime, however, Madeira certainly deserves the physician's most attentive consideration.

The great majority of invalids who winter in Madeira are English. Between thirty and forty Germans have visited the island of late years, but the French who winter there are very few. The Portuguese physicians have begun to send their patients thither, and one of them has written a treatise on the climate, which may be advantageously consulted by his professional brethren. See Dr. F. A. Barral's *Noticia sobre o Clima do Funchal e sua Influencia no tratamento da Tisica pulmonar*. Lisboa, 1854.

CHAPTER XIII.

ROADS—RIDES AND SHORT EXCURSIONS FROM FUNCHAL.

Filha do oceano,
Do undoso çampo flor, gentil Madeira.

Diniz.

It will be apparent, from what has been said in the chapter on the physical geography of Madeira, that nature has opposed obstacles of no ordinary kind to the formation of good roads, obstacles such as could only be partially overcome, even if the traffic were great, and the capital of the country abundant. But as neither of these conditions is present, it is not surprising that natural difficulties have in many cases been too much for the resources of the people. Indeed, when we come to examine the steepness of the slopes, the depth of the ravines, and the ruggedness of the whole island, it is marvellous that so much has been done in the way of road-making. To have made winding ways, except on the very steepest acclivities, would have entailed an immense addi-

tion to the toils of the labourers, and would, moreover, have absorbed a great deal of valuable land. An inclination of 14° (1 in 4) is not considered inconvenient. The Caminho do Meio, leading from Funchal towards the north, has an inclination of 23° (1 in $2\frac{1}{3}$), but this is notorious for its abruptness even amongst the islanders, who have named it *Caminho do Foguete*, i.e., Rocket Road. Near Sant' Anna, however, there is a road with an inclination of 27°, (about 1 in 2).* In the neighbourhood of Funchal the roads are usually well paved; in country districts, paved roads are also occasionally met with, but the stones are roughly laid down, and the footing for horses is often very insecure. By much the greater part of the country roads is wholly without pavement, and as many of them become beds of torrents in winter, their excessive unevenness, nearly amounting to impassability in the case of horses, may be easily imagined.

The place where visitors residing at Funchal

* The Simplon road has an inclination of only 5°, (1 in 12). Humboldt remarks that a slope of 5° is a well-marked one; that a slope of 15° (about 1 in 3) is too steep for a wheeled carriage; that a slope of 37° (about 1 in $1\frac{1}{3}$), is almost inaccessible on foot, if the ascent be a rock or a soil too hard for the formation of steps; and that a slope of 42° (about 1 in $1\frac{1}{4}$) is the steepest ascent that can be climbed when the soil is composed of loose sand or volcanic cinders. An inclination of 55° is completely insurmountable. Humboldt also states that the cones of volcanos have a mean inclination of from 33° to 44°; and that the steepest parts of Vesuvius, Teneriffe, and Jorullo have a slope of from 40° to 42°.

usually take horseback exercise, is the recently-formed road leading in the direction of Cama de Lobos. There are several other short country rides, all of which are paved, and more or less steep. The monotony, however, of a daily ride on the new road, sooner or later becomes unendurable, and diversions will doubtless be attempted. We may mention the roads leading near the churches of Saõ Roque, Sant' Antonio, Sant' Amaro, and Saõ Martinho, the Mount Road Levada, and the Palheiro and Santa Cruz roads. A narrow path, passable for horses, connects the two last-mentioned roads, and leads in its course near a group of stone pines, whence there is a good view of Funchal.

Longer excursions, capable of being accomplished within the compass of a day, may be made to Campanariõ and the edge of Cabo Giraõ; the Great Curral; Pico dos Bodes (a round-topped hill, with an extensive view above the Jardim da Serra); the great waterfall in the Ribeira de Santa Luzia; the Little Curral (ascending the excessively abrupt Caminho do Meio, and descending by the Mount Road); Ribeiro Frio; Pico Arieiro (whence the view is very extensive); the Palheiro grounds; Camacha; and Santa Cruz. These excursions, it must be observed, should not be taken by any invalid, except with the express permission of his medical attendant; for any of them will require

great exertion on the part of the rambler, and most of them will conduct him to heights some thousands of feet above the sea. Boating excursions may be made to Cama de Lobos and the foot of Cabo Giraõ; to Cabo Garajaõ, Santa Cruz, Machico, and the Fossil Bed. The last requires a long day for its accomplishment, if made from Funchal; it may, however, be more easily taken from Santa Cruz, if the visitor should happen to be a temporary resident at that place.

As to some of the places we have mentioned, and the paths by which they are reached, we must find room for a few words of description. The distances from place to place will, in most instances, be found stated in Appendix K.

New Road.—The large sums expended would, if properly managed, have sufficed to complete this road as far as Cama de Lobos, to which place it has hardly yet advanced half way. The part completed, however—the Rotten Row of Funchal—affords invalids an excellent piece of ground for horse exercise. The sea is near at hand, and the views of Cabo Giraõ are interesting; but the country, being thickly set with volcanic cones, wears rather a sterile aspect. In this part are plantations of cactus, where the cochineal insect is reared. In a recess near the Gorgolho Fort and rock, is Mr. Veitch's quinta. Amongst the sea cliffs between this spot and the city is a place

called the *Forja*, where the water is driven in the shape of spray through a hole in the rock into the air to a height proportionate to the force of the wave. The phenomenon is easily explained by a consideration of the form of the hollow into which the wave enters previous to the rush through the aperture above. Immediately below the Gorgolho Fort, close upon the water, is a section of a piece of basalt shewing the columnar structure very distinctly. Between the Gorgolho and Praya Formosa, near the brink of the sea cliffs, and at a height of about 80 feet above the water, is an elliptical funnel-shaped depression about 35 feet deep, the mouth of which is 520 feet in circumference. The name *Forno* (oven) has been given to the place. At the bottom is an aperture through which the sea is visible at a depth of about 45 feet. In stormy weather the water is sent upwards with great violence through the aperture, occasionally shooting into the air to the height of 20 or 30 feet above the edge of the depression. This place must not be taken for the crater of a volcano; there is no trace of any ejection from the opening; and the bedding of the surrounding rocks, shews that they did not originate at this spot. It is simply one of those cavernous hollows common in volcanic countries, its formation having been probably assisted by heaves from below, the hole being laid open by the giving way of the

Village of Cama de Lobos, and Cape Giram.

layer of soft tufa above. *Praya Formosa* is a bay raised very slightly above the level of the ocean at the foot of cliffs, in which are some large lateral hollows. In one part is a little forest of bananas; in another the remains of abandoned works formed for making salt from sea water.

Cama de Lobos, or *Camara dos Lobos,* a village about six miles from Funchal, may be reached from the city by two roads, one crossing the Ribeiro dos Socorridos at its mouth, the other crossing the same ravine by a good bridge a little higher up. The view on descending into the village of the little bay and its projecting wall of black basalt, with Cabo Giraõ as a background, is strikingly fine; but the village itself is a miserable place fast falling to decay. Its inhabitants are chiefly fishermen, many of whom have burrowed habitations in the adjacent beds of volcanic tufa and ashes. In the centre of the place is an ancient well; and some fine palm trees in a neighbouring garden will catch the eye. A boat may be obtained at Cama de Lobos, to visit the foot of Cabo Giraõ, where there are many landing places formed by rubbish thrown from above. At one place is a spring of fresh water called *Fonte Pedrida;* at another some ladders will be seen at a height of 200 or 300 feet on the face of the cliff. These were used to obtain access to some quarries, but an accident, attended by loss of life, occurred here

many years ago, and the quarries were abandoned.

Crossing a bridge, the road begins to climb the flank of Cabo Giraõ, to reach the village of *Campanario.* This road is very steep, and only effects the ascent by many windings. On reaching the summit, if a turn is made towards the south, passing through a wood of pines, we arrive at the verge of the cliff, 1920 feet high, visited by many persons for the purpose of experiencing the sensation, "how fearful and dizzy 'tis, to cast one's eyes so low." (See page 51). A long line of coast is visible from this place, and the Desertas seem to hang between heaven and earth. The district of Campanario offers a suitable climate to invalids spending the summer on the island, and there are a few houses which can be hired for the season. At the Achada stands the largest Spanish chestnut on the island. It is apparently very ancient, and a conjecture has been thrown out that it may date farther back than the discovery of the island, in which case, of course, the chestnut must be counted amongst indigenous plants. The trunk has a girth of 35 feet; it is hollow, and a small room, fitted with a door, has been made in it. From Campanario a road strikes northward to the Jardim da Serra, and another one descends into Ribeira Brava.

The Grand Curral (*Curral das Freiras*) is a

deep valley lying within a moderate distance of Funchal, and accessible by tolerable roads. No part of the scenery of Madeira is better known, or indeed is more worthy of being known, than this spot. It is usually the first place to which explorers direct their steps; every "middy" employs his first day's leave of absence in galloping to the wondrous scene; and its fissured scars have re-echoed the laughter of many a pic-nic party. "The most striking peculiarity, says Mr. J. D. Dana, of the mountain scenery of Madeira, consists in the jagged outlines of the ridges, the rude towers and needles of rock that characterize the higher peaks as well as lower elevations, and the deep precipitous gorges which intersect the mountains almost to their bases. The Curral is one of the most wonderful of these gorges, and though often a theme for the traveller's pen, its grandeur yet remains untold. The enclosing walls of two thousand feet, the narrow strip of green at the bottom with its winding rivulet, its chapel and its vineyards, reduced to a miniature size by the distance; the bold turrets of rock that tower up from the depths of the gorge, and above the highest western walls the summit of Pico Ruivo, are some of the features of the scene."

The Curral lies nearly in the centre of the island, surrounded by some of his loftiest peaks. Its upper part has so much of a basin shape, and

contains so many dikes of igneous rock, that have entertained many observers to the opinion that it was once the grand crater of a volcano; but careful examination proves that such an opinion has no evidence to support it. A road leads along the bottom of the Curral, having many charming views on both sides, and crosses the Torrinhas Pass at the height of nearly 5000 feet, into the ravine of Boa Ventura. A little below the church of *N. S. do Livramento* (our Lady of Deliverance), which stands at a height of more than 2000 feet above the sea, the valley suddenly contracts, and the stream escapes to the sea through a deep trench which is not wide enough to admit of a road.

Two points on opposite sides of the ravine are visited for the purpose of reconnoitring it. The shortest road is that which conducts the traveller to the eastern side; but the point on the western brink presents a more magnificent picture. To reach it we cross the Socorridos ravine, ascend to the Estreito Church, and pass Mr. Veitch's celebrated quinta, the *Jardim da Serra* (2526 feet above the sea), the grounds of which are planted with many rare shrubs and trees. Passing through a belt of chestnut trees we leave the Pico dos Bodes on the right. This is a hill with a rounded summit, visible from Funchal, and commanding an extensive view, on which account it is often visited.

The spot whence the view into the Curral is obtained is on the road leading to S. Vicente at an elevation of 4300 feet. Pursuing the road for about an hour along the narrow ridge dividing the Serra d'Agoa from the Curral, we reach the flank of Pico Grande, where a narrow path zig-zags down into the Curral.

A Waterfall, often spoken of as *the* waterfall, lies hidden in a chasm at an elevation of between 3000 and 4000 feet, in the upper part of the Ribeira de Santa Luzia. In order to visit it, either bank of the ravine may be ascended on horseback to a certain point, and then its stony bed must be had recourse to. The rest of the ascent is very fatiguing, and between two and three hours will be consumed in reaching the fall from the point where the horses were abandoned. Persons may, however, be carried up in hammocks. The quantity of water, except after rain, is not great, but the fall is high enough to convert the element into spray. The whole fall is not more than 300 feet, and it has a break at the termination of the first 100 feet. Compared with the loftier cascades of Europe, which

> ——— Spill
> Their thousand wreaths of dangling smoke,
> That like a broken purpose waste in air.

This would suffer greatly; but it is well worth a visit on account of the accessories of the scene,—

the luxuriant shrubs and ferns that fringe the crags around, planting themselves on every ledge, and rooting in every cranny.

Saõ Roque.—The road passes the convent of Santa Clara and the Peak Fort. The views from the vicinity of the church, which stands on a platform about 1129 feet above the sea, are very good. A narrow picturesque path leads for a short distance along the brink of the Ribeira de Santa Luzia to a little chapel at the edge of a chestnut wood, dedicated to *N. S. d'Alegria* (our Lady of Joy).

Mount.—The district known as the Mount is that surrounding the church of *N. S. do Monte*, a conspicuous object from the bay, which looks down from amongst chestnut trees upon the sea, from the height of 1965 feet. The road is well paved but steep. The image of our Lady is held in great veneration by the sailors of Funchal, who resort thither to pay their vows and make their offerings before setting forth on their voyages. Many legends are told of the gracious assistance which she has extended to mariners in peril; and there is a story to the effect that once, years ago, on the occasion of a famine threatening the island, a religious procession of the inhabitants, headed by the priests, was made to the church, and the happy result of the Virgin's influence was apparent next day, when a ship laden with grain arrived in the

bay. What made the matter clearer, was that the dress of the image was found to be wet with sea-water. Moreover, a white figure had been seen by the sailors drawing the vessel towards the shore in the absence of the wind. A legend very similar to this is related of our Lady of Candelaria in Teneriffe. In the neighbourhood of the church are several quintas, on the grounds of which are many specimens of trees from Australia and China (Eucalyptus, Banksia, Camellia, etc.), as well as good specimens of the native trees of Madeira. Mrs. Gordon's grounds are perhaps the best worth looking at. The Little Curral, or *Curral das Romeiras*, containing some wild scenery, is near at hand. A bridle road leads through it connecting the Mount Road and the Caminho do Meio. Instead, however, of descending this road, the steepness of which has been already noticed, the ride may be extended along the face of the hills to the Palheiro Road.

Palheiro do Ferreiro (Blacksmith's Hut) is the name of a quinta belonging to the Conde de Carvalhal, situated on the ridge to the east of Funchal at a height of about 1800 feet above the sea. Special permission from the owner is requisite to obtain an entrance into the grounds, which contain fine specimens of *Araucaria brasiliensis*, Camellia, Portugal Laurel, *Cereus peruvianus*, and *Aloe plicatilis*. The views from many parts of the

grounds, which are extensive and park-like, are extremely good. It will take nearly an hour to reach the Palheiro from Funchal.

Camacha, a scattered village 2200 feet above the sea, is about half an hour beyond the Palheiro gate. Every one exclaims, when he sees its green meadows and neat houses, "How like England!" Being at a convenient distance from Funchal, many of the English merchants have built houses here; and Mr. Hollway has a house in the neighbourhood for the reception of boarders during the summer months. From the Achada we look down into ravines where pointed rocks remind us of the *aiguilles* of the Alps.

The church of *Sant' Antonio da Serra*, situate on a large plateau, is two hours distant from Camacha. Near it stands the Pilgrim's House, built by subscription several years ago for the accommodation of persons journeying in this part, the keys of which are in the keeping of the vicar. Several of the Funchal merchants have built houses on this plain for their habitation in summer. In one part of the Serra at a place called the *Atoleiros*, a word signifying a bog, is a treacherous quagmire, in which cattle and even human beings have been engulphed. In another part is the crater, called *Lagoa* from the pond at the bottom, mentioned in the chapter on geology. The edge of the crater is elevated about 2289 feet above the sea. Here-

Penha d'Aguia (Eagles' Rock), from the Lamaçeiros.

abouts, as well as on other parts of the Serra, there is much whortleberry. Near the Lagoa, at a place called *Marcellos*, there is a very beautiful prospect over the valley of Machico.

Roads lead from *Santa Serra* (as the country people frequently term it) to Santa Cruz and Machico; in some parts they are very steep, but in other respects they are tolerably good. Two roads to Porto da Cruz on the north coast cross the central crest of mountains, at the passes of *Portella* and *Lamoceiros*, from both of which the views are strikingly fine. The latter pass, however, should be selected when both cannot be visited, the position being somewhat more favourable for obtaining a general effect than that of the Portella. One of the finest landscapes on the island is here before the eye. The Penha d'Aguia, which stands by the sea apart from all the other hills, and rises to the height of 1915 feet, is the principal feature in the scene. There is much wood on the slopes to the left, and many bold ridges fall in grand sweeps to the shore. The Cortada ridge closes in the view on that side. At the foot of the Penha stands the village of Porto da Cruz on the margin of its little bay; beyond, the church of Fayal is seen perched on a shelf of rock. Of the two descending roads, that from the Lamoceiros pass is generally preferred, its gradients being rather easier than those of the other.

Santa Cruz.—This village is situate on the coast east of Funchal, at the distance of three hours either by boat or on horseback from that city. The road, passing through the hamlets of Caniço and Porto Novo, is uninteresting after the bay of Funchal is shut out from view. About a mile from the city, the gate of the Lazaretto is passed near the mouth of the ravine of Gonzalo Ayres. Three quarters of an hour from the city, a small chapel, dedicated to *N. S. das Neves* (our Lady of the Snows), is seen occupying a picturesque position not far from the edge of the cliff, where its height is not much short of 1400 feet. Near the chapel are a few small dragon trees. The headland of Cabo Garajaõ lies to the right a little further on, but it is not seen from the road, and it is rather difficult of access even on foot. Between Porto Novo and Santa Cruz the road is very rough and the country bare and uninviting. The village of Santa Cruz, a very dull place, possessing few attractions, stands at the mouth of a ravine on the margin of a small bay backed by steep mountains. In the grounds attached to Mr. Grant's quinta is a tall date palm, which annually bears a bunch of fruit weighing from 60 to 80 lbs. The church was erected in 1515 by order of Dom Emanuel, who was stimulated thereto by Joaõ de Freitas, a gentleman of his household. There is a small piece of ground planted with trees in front

of the edifice. The adjacent Town Hall bore until lately the date 1513, but the authorities, seemingly ashamed of its "advanced age," have removed the figures, and have made other attempts to give the building a juvenile air. The hotel, which persons from Funchal sometimes visit for a few days in spring by way of obtaining change of air, is a good house standing at a short distance from the village. The landlord, Snr. Joaõ Gonsalves, speaks English.

Machico.—Continuing to pursue an easterly direction along the coast, we pass an old Franciscan monastery, partly built by one Urbano Lomelino in 1515, which is now deserted and falling to ruin. Near this place a path strikes northward up the hills to S. Antonio da Serra. The country is barren and without interest until we arrive at the descent into the valley of Machico. The soil is of a deep red, and hence the name given to one of the points, *Ponta Queimada*, or Burned Point. The commencement of the descent is about 300 feet above the valley, and the path though winding is steep. The situation of Machico is beautiful, but the village itself, like most in Madeira, is a miserable place. The green and smiling valley is encircled by rugged mountains, the highest of which is Pico Castanho (2058 feet). The beach is extensive; above on the eastern ridge is a telegraph which is

in communication with that at Brazen Head. Near the sea is a fort which bears the long name of Forte Desembarcadouro. Machico, as we have already stated, is reputed to derive its name from Machin, who is said to have been driven on the neighbouring coast, along with his fugitive bride. There is a tradition that the existing chapel occupies the site of that erected by Machin's companions; and a fragment of wood is produced by the sacristan to the curious, who are asked to believe that it is part of the cross of cedar wood raised by him over the remains of Anna D'Arfet. The whole story is firmly believed by the people of Madeira; and, indeed, why should they doubt its truth when they have tradition, mention in ancient books, and a piece of wood? In the church is a picture—the Adoration of the Three Kings—which enjoys some local repute. After contemplating for a while, as did Bowdich, "the picturesque peaks which frown upon the burial place of the unfortunate Anna," we may, instead of retracing our steps to Santa Cruz, follow the road which leads up this lovely vale. In so doing we pass some houses which are occasionally hired by strangers as summer residences. One of these, the Quinta de Sant' Anna, a large pile, stands out well on a tongue of land that projects at a point where the valley branches. Bending hereabouts towards the west it keeps at a considerable height

Rocks and Cliffs near the Fossil-bed.

above the bottom of a deep and narrow glen, the lower slopes of which are clothed with native wood. A road striking off on the left climbs steeply up to the Serra of S. Antonio, whilst the main road pursues its course up the ravine to the *Portella* (Little Gateway), a pass already mentioned as commanding a magnificent view. The descent is very abrupt to the village of Porto da Cruz, which may be plainly seen below.

The *Fossil Bed* may be visited by means of a boat either from Funchal, Santa Cruz, or Machico; but let us suppose that we take the water at the place last mentioned. The cliffs between Machico and Caniçal (a church and a collection of huts in a desolate situation) present a lofty escarpment to the water. The chapel of *N. S. da Piedade*, which has been seen from far, crowns the apex of a conical hill, half of which has been removed by the sea, disclosing a dike in its centre. Landing may be effected on the rocks at either side of this hill (which has a height of 350 feet), and then a northerly direction must be taken. In a quarter of an hour the bed of calcareous sand will be reached, where are found the dead land shells and branch-like pieces of carbonate of lime, which are spoken of in the chapter on geology. By walking across the promontory, here very narrow, a fine view of the northern coast as far as the Cortada point is obtained.

Ribeiro Frio.—Passing the Mount Church and leaving the belt of chestnut wood behind, the road emerges upon bare slopes, and winding through the upper part of the Ribeira de Joaõ Gomez, makes its way to the Poizo, where there is a house of refuge at a height of nearly 4500 feet above the sea. In case the rambler's object be to visit the icehouse on the Serra de Balcaõ (where the snow of winter is stored for summer use in Funchal), or the summit of Pico Arieiro, a divergence must be made to the left before arriving at the Poizo. A road leads in the opposite direction along the main ridge of the island to Camacha and S. Antonio. Pursuing the road to Ribeiro Frio, we descend a little, and then come upon a flat tract named Feiteiras, from the quantity of brakes upon it. Then comes a steep declivity covered by a forest containing some noble trees amongst which the road descends to the stream which gives its name to the ravine (Ribeiro Frio, *i. e.*, Cold Stream). The scenery of this part of the ravine has been compared to that around Killarney, and the botanist will not think less of the comparison when he finds the Bristle fern (*Trichomanes radicans*) in some of its nooks. After crossing the second bridge the road may be left in order to obtain some striking views of the adjacent valley of Metade. Climbing a steep bank and walking upon the parapet of a watercourse we pass through

a cutting, and emerge upon a wonderful scene. If the pedestrian be sure of his head and his strength he may safely walk for miles along this levada, as it winds in and out from its source under Arieiro. The views all along are of the finest possible description.* The main road proceeds to Sant' Anna, but to pursue it farther would lead us beyond the limits of a days' excursion from Funchal.

* An abler pen than ours has well described the scenery of these two valleys. We refer to an anonymous volume, published several years ago, entitled "Rambles in Madeira and Portugal," of which it is understood that a Mr. Lyall was the writer. His sketches of the landscapes of Madeira are spirited and accurate, and will well repay perusal.

CHAPTER XIV.

DISTANT EXCURSIONS—THE NORTH.

> Those loftier scenes Salvator's soul adored:—
> The rocky pass half hung with shaggy wood,
> And the cleft tree flung boldly o'er the flood,
> The track that to the night of caverns led,
> Some ancient cataract's deserted bed.
>
> *Rogers.*

In preparing to set out on an expedition of some days' duration, it will behove the traveller to devote a little consideration to the arrangement of his conveyance and commissariat, or his breakdown may be as complete as that of a certain army in a certain part of the empire of Russia. He must bear in mind, in the first place, that the houses where he can obtain accommodation are few and far between, and that as their visitors drop in at wide and uncertain intervals, it is not to be expected that a well-stocked larder can be in constant readiness, or beds always prepared for the reception of weary travellers. It is therefore absolutely necessary either to send word some days beforehand to inform the landlord what

accommodation will be required, or to take such a supply of provisions as the traveller may need during the excursion. Eggs, fowls, and potatoes can be obtained anywhere, but it will be desirable to lay in at Funchal (in case notice is not previously forwarded to the innkeeper) a stock of fresh bread, butter, white sugar, good tea, and butchers' meat or some tins of preserved meat. Out of Funchal, houses for the reception of strangers are only to be found at Santa Cruz, Sant' Anna, Ponta Delgada, Saõ Vicente, and Calheta. The usual rate of charge is two dollars a day when provisions are furnished, or one dollar when the visitor supplies his own provisions.

Then as to the means of progression. The easiest mode of travelling is in a hammock, but as little of the country can be seen when this conveyance is used, probably the best plan will be to take both a horse and hammock, having recourse to the latter only occasionally by way of relief. It will be very difficult to find any one in the country who understands shoeing; for the *padres* do not here undertake this duty, as they do in Iceland. The attendant burriqueiro should therefore know something of the farrier's art; and a supply of shoes, nails, and the necessary shoeing implements, should not be forgotten. Before the traveller has been many days at the north, he will discover the value of what Don Quixote said when

he laid down the rule that a knight-errant ought to know how to shoe a horse, and to keep his saddle and bridle in repair. As to hammock-bearers, the men from the country (Santa Cruz, Camacha, or Sant' Anna) are better adapted for the hard work of a long journey than those of Funchal, and moreover they are satisfied with a less amount of pay. The number of men required for each hammock will depend, of course, on the weight of the person to be carried and the length of the journey. The usual rate of pay is from seven bits to a dollar a day. It is highly desirable to come to a clear understanding with the men as to the exact amount of their remuneration, and it will be well to retain part of their pay until the completion of their engagement.

The traveller's baggage may either be carried on men's shoulders or by mules. Luggage porters will expect nearly the same pay as hammock-bearers. A strong mule may be hired at Funchal at the rate of a dollar per diem, with two bits to the attendant, that is to say, five shillings will cover the daily expense of a mule and its driver. Muleteers may be heard of at the shops of Mr. Payne and Messrs. Carvalho.

For an account of the distances from place to place the reader is referred to Appendix. When the stranger does not remain upon the island through the summer, the best season for visiting

the north is during April and May. No one who possesses the requisite amount of corporeal strength should leave unviewed the wild grandeur of the northern coast.

To those who wish to examine thoroughly the scenery of Madeira, or to search its thousand heights and hollows in pursuit of insects, plants, or geological phenomena, the plan of hiring a man in each valley to act as a guide in their explorations is recommended. Spring and summer will glide away during such occupations long before the island is exhausted. A tent will be found useful with some portable furniture, such as will enable the rambler occasionally to pass the night amongst the hills without much discomfort. As to the fascinations of tent life, the reader is referred to the introduction to Mr. Wollaston's book on the Insects of Madeira.

Sant' Anna, a district on the north coast, is, from its accessibility, more frequently visited by strangers than any other part of that coast. The nearest and best road is that through Ribeiro Frio. It is perfectly good and safe throughout, though very steep in several places, and caution will be required on the part of horsemen unaccustomed to the roads of Madeira. The journey from Funchal to the hotel at Sant' Anna will occupy about six hours and a half (not including stoppages for rest, refresh-

ment, etc.); and the ride, from the number of ascents and descents, is fatiguing. As far as Rib. Frio, the road has been already described. At the point where it turns to quit Rib. Frio for Rib. Metade, there is a retrospective view which is one of the finest on the line of march. Soon afterwards, there occurs the station of another grand view, but of a totally different character. The point is near the top of the steep descent called Pao de Sebastiaõ. The spectator looks across the upper part of the immensely deep Metade ravine to the escarped and furrowed flanks of Arieiro, the Torres, and other mountains clustering round Pico Ruivo, which is itself invisible. The road winds through magnificent scenery, defiling in its course through a third great ravine called Ribeiro Secco, and then ascending a breast called Lomba Galego, whence a good view of Penha d'Aguia and the northern coast as far as Point S. Lourenço is obtained. This is at the distance of rather more than an hour's ride from the hotel at Sant' Anna. A picturesque bridge and mill in a nook at the distance of one hour and a half from the same place, will be attractive to the sketcher, contrasting forcibly in its humble style of beauty with the grandeurs he has previously witnessed. Quitting the ravines, the road emerges upon sloping uplands clothed with brushwood, and gradually descends towards the sea, passing the

church on the way to the hotel. This hostelry is the property of Snr. Luiz Acciaioli, a gentleman of station in these parts. The house is a large one, placed at a point commanding good views, at a height of about 1090 feet above the sea. The landlord is a very obliging man, and the accommodation quite as good as can be expected in a spot so retired as this, where almost every article of consumption must be brought from Funchal on men's shoulders. Families spending the summer on the island frequently make arrangements to reside a few weeks at this place. Houses can also be hired in the neighbourhood, which abounds with shady lanes affording easy rides to invalids. There are some beautiful points of view at various places on the edge of the sea cliffs; and several of the glens deserve investigation. In one of them there is an extremely pretty waterfall—the *Agoagem da Silveira.* The stream runs into the ravine of S. Jorge, amidst rocks and under foliage that calls to mind one of the dells which Spencer has described—

> And all the margent round about was set—
> With shady laurel trees.

Many excursions to distant points of interest may be made, and some of these shall now be described. Snr. Acciaioli may be referred to for more particular information; and the Visitors' Book at the hotel will also afford some hints as to what is best worth visiting.

The parish of Sant' Anna is large, containing many scattered houses, but nothing to call a village. The district from a distance presents to the eye extensive and tolerably even slopes descending gently from the mountains to the sea-cliffs. On nearer approach they are found to be intersected by many ravines. Maize is a good deal cultivated in this parish. Orange trees abound; a group of bananas will be seen here and there; but no coffee trees, sugar cane, or sweet potatoes will be met with. Much cattle is fed here for the Funchal market.

Fayal and Porto da Cruz.—A pleasing ride of an hour brings the traveller to the Cortada ridge, where, leaving the open country behind him, he passes through a gap, and comes all at once upon the huge Eagle's Rock, which is presented to view from its foot in the sea to its highest pinnacle with theatrical suddenness of effect. The road winds downwards in front of a steep slope, with the sea almost immediately under the eye, to the bed of Ribeiro Secco, and the western foot of Penha d'Aguia, passing the church of Fayal by the way. In consequence of the heat reflected from the surrounding precipices, fruit ripens in this neighbourhood earlier than at most places on the northern coast. A road of singular steepness zig-zags up these slopes towards Funchal at a place called Ladeira do Fayal. It is all but impassable to per-

sons on horseback. Indeed, all the roads hereabouts are terribly trying to the feet of horses and the nerves of their riders. The Penha has a height of 1915 feet; its summit is not inaccessible, though the ascent, which for the greater part of the way must be made on foot, is toilsome. The views from this isolated station are extremely fine. This mountain is a mass of volcanic matter, which possibly issued from vents situate to the north of that central line of vents out of which the chief part of the island was poured. To all appearance, a great quantity of matter has been removed from between the central mountains and the Penha. At its western foot, three deep ravines come down from the mountains, and unite their scanty waters before entering the sea at Fayal. These are Ribeiro Secco, Ribeiro de Metade, and Ribeiro Frio; all of them are crossed at the upper part of their courses by the road from Funchal to Sant' Anna. Pursuing the road, however, to Porto da Cruz, we stumble along the stony beds of these ravines near their mouths as we best can, and then climb a low ridge, connecting the Penha with the main chain of mountains, to descend upon the village we are in search of. It is a small place, standing in a warm situation near the sea. The wine of the neighbourhood had a greater reputation than that of any other spot on the north coast. Some of the low hills near the village are capped with a

grey felspathic lava; and at a place called *Quebrada*, in the side of the *Achada* hill, as well as higher up in the same ravine at a place known as *Soca*, a mass of sienitic greenstone may be seen *in situ*. Roads proceed to Machico and S. Antonio da Serra by the Portella and Lamoceiros passes, which have been previously noticed in this volume.

Pico Ruivo.—The ascent of Pico Ruivo is more easily made from Sant' Anna than from any other place. This mountain, indeed, is only accessible on one other side, namely, the Curral, from which place much of the way must be gone over on foot; whereas from Sant' Anna the rambler may use a horse or hammock for the whole distance. It is desirable to start by break of day, not only to avoid the inconvenience of travelling under a hot sun, but for the enjoyment of an uninterrupted view. As the sun increases in power, clouds rise into the atmosphere, and before noon much of the panorama is usually concealed. Persons sometimes go in the night to a hut called *Choupana*, perched at a considerable elevation, in order to get over the remaining distance in time to see the sun rise. Starting from the hotel the ascent will occupy from three to four hours, excluding stoppages for rest, which are necessarily numerous. There is little to interest in the lower slopes, which are thickly covered with heaths, whortleberry, furze, and broom. The first peak approached is

Pico das Pedras, with a double summit. Continuing the ascent, and passing the Choupana, we arrive at a singular object, called by the peasants *Homem-em-pé* (man erect). This is a collection of shattered basaltic columns, forty feet high, standing isolated on a grassy slope. An elder tree has taken root in a crevice on its north side. Winding over the shoulder of Barreiro, and passing along a piece of level ground from which we look down into Ribeiro Secco, and across Rib. Metade and Rib. Frio, we skirt the base of Encumiado Alto, and then make a rapid descent to the neck or Boca connecting this hill with Pico Ruivo. The views from this neck into the Rib. de Saõ Jorge on one side, and into the head of Rib. Secco on the other, with Arieiro, the Torres, and Ruivo around it, are very striking. Hereabouts are old heath trees blown by the wind into a hundred fantastic shapes. The ascent of the actual Pico begins at a spot called *Areal;* horses cannot be taken any further, but a couple of men will carry a hammock to the top in a quarter of an hour.

And now for the view from this, the loftiest point in Madeira. Of the Curral only the upper end is visible, Sidraõ intercepting our view of the lower part; Pico Grande is seen from base to summit in all his majesty. The Pico de Fora in the Serra d'Agoa is caught through a depression. In the west is the long line of the Paül da Serra,

with a few peaks rising slightly above the edge of that lofty moor; and between them and us is the green ridge dividing Saõ Vicente from Boa Ventura. Close at hand is Pico Canario, and beyond are the craggy Torrinhas (Turrets), a series of peaks connecting Canario with the Pico de Jorge, a mountain which knots together many diverging ridges. The ravines of Boa Ventura and Saõ Jorge are separated by a ridge which connects Canario with the Pico do Arco. The upper part of Saõ Jorge is rich with wood and diversified with purple precipices; near its mouth the village and its church can be made out, over against the church of Sant' Anna and Snr. Acciaioli's house. Out at sea Porto Santo will be descried. Part of the Cortado ridge is visible, the rest being hidden by Encumiado Alto, over which the summit of Penha d'Aguia is caught. Turning eastward, the eye sinks into the depths of Ribeiro Secco. Beyond is perceived the Funchal road as it passes from Rib. Metade to Rib. Frio, and again, as it crosses the Feyteiras towards the Poizo. Farther off in this direction is a ridge striking from the main crest towards Porto da Cruz; and still farther away are the Serra of S. Antonio; the depression where lie the Lamoceiros and Portella passes; and the mountains at the head of the green valley of Machico, from behind which Castello Point with its arched rock, and Point Saõ Lourenço push for-

ward. The Desertas will not remain unnoticed. Turning southwards, the Torres (Towers) with their wild broken summits are close at hand, connected with Ruivo by a thin wall of impassable rock. The red tufa of the Torres is strangely intersected with basaltic dikes and veins. Part of Arieiro is seen through some of the notches. To the right is the Pico de S. Antonio, and nearer us is Sidraõ walling in the Curral.

Such is an outline of the tumultuous scene, in the midst of which we stand when our feet are upon Pico Ruivo.

The *Ribeiro de S. Jorge* is one of the principal ravines of the island, and the extremities of its many branches are grooves on the northern side of the central chain of mountains. Near its mouth, where it is crossed by the road from Sant' Anna to S. Jorge, it has a depth of nearly a thousand feet. The traveller by this road, on casting his eyes up the ravine, will perceive that it divides into two grand branches, and that a large tract of mountainous land is embraced by them. This is called the *Ilha*, and the whole of it belongs to a *Morgado*, who has the local title of Morgado da Ilha. The eastern branch of the ravine is called Ribeiro do Lombo, or do Marquez. A hamlet will be noticed perched on an elevated terrace in this branch (probably the effect of a landslip), which bears the name of Achada do Marquez. The western

branch, which penetrates to Pico Ruivo, is called Ribeiro Grande, and it is here, at the distance of three hours from the hotel of Sant' Anna, that the lignite and leafbed spoken of in the chapter on Geology are found. The mountains that tower around the head of the ravine consist of Canario, on the west of a conspicuous depression (*boqueirão*), Pico Ruivo, Encumiado Alto, Pico de Homem-em-pé, and Pico das Pedras, on the east of the same gap.

Besides the road which traverses the ravine of Saõ Jorge, near its mouth there is another, called the Pedra Molle road, a little higher up, which climbs the western bank at Fajaã Alta. The road is bad and steep on both sides, but the views are very good.

Boca das Voltas.—The ridge which joins the Pico do Arco to Canario is crossed at a place called the *Boca das Voltas*, by a road which descends, by a series of windings (*voltas*), into the deep and narrow Ribeira de Boa Ventura. The Boca has a height of probably 2000 feet; and commands a very fine view of the mountains at the head of Boa Ventura. It will take about three hours to reach the spot in a hammock from Sant' Anna.

S. Jorge.—Leaving Sant' Anna behind us, let us set off on a ramble along the northern coast in the direction of Ponta Delgada, and Saõ Vicente. The scenery is varied, and everywhere interesting. Plunging into the ravine of S. Jorge, and climbing

up the other bank, we come upon the hamlet of S. Jorge, where invalids sometimes spend the summer in preference to Sant' Anna, the climate being less humid. The rides in this district are numerous. From a spot near the Point of S. Jorge, called the Vigia, the whole coast westward as far as Point Moniz is visible. The point of Sant' Anna intercepts the view eastward, the extremity of the island near Castello Point being alone visible. The road crosses a deep but short ravine, called Ribeiro Fundo, and then ascends gently to the edge of the

Arco de S. Jorge, whence we look down upon a fertile tract, sprinkled with cottages, corn fields, and orchards, and hemmed in between the ocean and a curved wall of lofty precipitous rocks, split by innumerable fissures, and beautifully feathered with native wood. Descending into this secluded yet smiling nook, we leave it at the other side by a road cut in the face of a precipice which overhangs the sea. At its culminating point the promontory of Moniz comes into sight, and at this spot begins the Entroza* Pass. The road winds steeply down into the valley of Boa Ventura, of which good views are obtained during the descent. A hill standing conspicuously in the middle ground is named Pico do Alves; in the distance glimpses of the Torrinhas are obtained.

The word *Entroza* signifies a toothed wheel.

Boa Ventura (literally, Good Luck) is a name given both to the ravine and to the hamlet near its mouth. Indifferent accommodation for the night may be obtained by one or two persons at the Vigario's house, near the church dedicated to Saõ Queteria. The ravine is a long narrow rent without branches, terminating at the Torrinhas, amongst which there is a pass into the Curral. For some distance the road is tolerably good; but as the upper end is approached it becomes extremely rugged and steep; and hence a hammock is to be preferred to horseback. The scenery of the lower part of the defile bears a similarity to that of some other ravines in Madeira; but the higher portion is quite peculiar and very striking, on account of its depth, narrowness, and rich garniture of wood. In some respects it will remind the traveller of the Via Mala in Switzerland, but vegetation is here more rife and luxuriant. Noble trees fling their arms across the path, their trunks and branches covered with moss and lichen. The Hare's-foot fern will be noticed climbing like a goat up the face of rocks and into the arms of trees. The height of the pass cannot be far short of 5000 feet. The view to the south is of a very different character to that on the north. Here we have a broad ravine surrounded by bare rocky mountains, the outlines of which look as sharp and hard as if they had been cast in iron. Many dikes

will be seen hereabouts, in some places standing out like ruined walls, in others marking a line on the face of a mountain, from its base to its summit.

Ponta Delgada (Narrow Point).—The distance between Boa Ventura and Ponta Delgada is not great, but the road is bad. The tract upon which the village of Ponta Delgada is built, has evidently been formed by a landslip on a grand scale, like that which formed the Arco of S. Jorge. It is a low piece of ground projecting in front of precipices into the sea. The church was built in 1745, and is dedicated to Saõ Jesus. The Vigario has lately erected a good house in an excellent position, and this he is willing to let during the summer months. Strangers can have accommodation for the night here. If the roads were better, and the rides more varied, this would be a desirable place for summer quarters; but although there are many favourable stations for views, and many pretty dells in the neighbourhood, they are so difficult of approach, that most people would reckon them inaccessible.

The road pursues its westward course in front of lofty sea cliffs, over which water is now and then seen pouring, but usually not in sufficient quantity to form a cascade in summer. In many places the road dwindles to a mere footpath threading its way amongst débris; at others it is carved out of the

rock. At length the traveller comes all at once upon the mouth of the valley of

S. Vicente.—The cliffs are here so lofty, and the rent so narrow, that the traveller has no warning of his approach to one of the larger valleys of the island, until he finds himself actually at the entrance. At this point his attention is arrested by a lone black rock rising from the shingle of the beach; and his interest in the sight will not be lessened, when he discovers that the interior has been hollowed into a little chapel dedicated to the patron saint of the valley. Crossing the stream by a new stone bridge, he will pass through the *villa*, half a dozen houses near a church. The inn is nearly half an hour beyond. It contains three or four clean bed-rooms, but the accommodation in other respects is poor. It may however be made tolerable by a little arrangement (such as giving due notice of an intention to visit the place, and taking care that a proper supply of necessaries is sent from Funchal), and the rambler may be induced to give himself a little trouble on this head, as well as to put up with some inconveniences, when he learns that the valley abounds with picturesque scenery well deserving of being visited by the lover of nature. We have no space, however, to do more than to throw out a few hints for his guidance.

The eastern side of the valley of Saõ Vicente

is composed of a line of precipitous mountains, which here and there throw off narrow spurs towards the stream below, like buttresses supporting a lofty wall. On the western side, the mountains form a curve, and embrace many richly wooded recesses. The bottom of the valley, too, is well sprinkled with trees, principally native laurels and chestnuts, into which vines are trained with beautiful effect. Orange trees are numerous, and attain to a large size. The aspect of this valley with its scattered houses, orchards, and fields of grain, is altogether more gay and laughing than any other in Madeira. There are many points from which good views are obtained. One of the best is from the main road between the *villa* and the inn, looking towards the noble Pico das Freiras at the head of the valley. At the upper end of the ravine, where the road begins to climb to the Encumiada Pass, the mountains on the right have some long straight lines in their contour, and there is a vast precipitous rock towering and rounded like the keep of a fortress. These regular figures are in striking contrast with the wild and broken outlines around them.

For general views the Achada das Ginjas, Lomba dos Quebrados, and Lomba das Fayas, may be visited. The Ribeiro do Lanço deserves to be explored; for in gullies at its upper end there are several waterfalls. The Forno do Cal, the place where

some limestone containing fossils is exposed, lies on the opposite side of the valley over against the inn. The road is very rough, and hardly passable by horses. This valley abounds in beautiful waterfalls, and many of them may be seen with very little trouble; for instance, the Poço do Passasol, Poço Polido, and Poço das Calas are all near the main road leading to the Encumiada Pass. Much lovely stream scenery will be found here, especially near the hamlet of Magdalena. The lateral glens are rich with native vegetation, and their investigation will afford the botanist much pleasurable employment. Seisal, on the coast, may be reached by boat in three quarters of an hour; it will occupy two hours and a half to reach Porto Moniz. That extensive moor the *Paül da Serra* spreads itself out on the summit of the mountains that shut in the valley of Saõ Vicente on the west. The road, which is a very rough one, winds up a steep slope commanding fine retrospective views over the valley. A few hundred feet below the edge of the Paül the road enters a small combe called the Chaõ de Caramujo, carved out of the side of the mountain. Above this some fine Adernos, Folhados, and heaths are passed. One of the heaths, standing on the right of the road, has a height of 30 feet, and the trunk a girth of seven feet. At the edge of the Paül is a small spring where deliciously cool water is found during

the heats of summer. This place, well known to the peasants far and near as *Os Tanquinhos*, is distant about two hours and a half (on horseback) from the inn of S. Vicente. The Paül has an elevation of about 5000 feet; the greater part of the surface is covered with brushwood, but one tract, the Campo Grande, is quite bare. Patches of a species of thyme (*Thymus micans*) are found on this plain.

A short distance to the north-west of the Tanquinhos there rises a conical peak called *Pico Ruivo do Paül*, which deserves to be ascended for the sake of its view, if the traveller can afford the time. Its summit (5210 feet in height) may be attained in a twenty minutes' ride from the spring. The mountains in the west, Pico Ruivo the Great, Canario, the Torres, Pico Grande, etc., are drawn out in grand array. The eye sinks with wonder into the ravine we lately left. Those chasms, the Ribeiro do Lanço and the Ribeiro do Inferno, reach up to our very feet. Westward the view ranges over the whole plain of the Paül to the ridges which inclose the Ribeiro de Seisal and the Ribeira da Janella. The most distant part of the middle ridge is called Fanal, and on the flanks of this ridge there are fine forests of native wood. In this district there is a crater as perfect as the Lagoa of S. Antonio da Serra. The chain of mountains to the south and south-west of Janella looks very well from this point.

The descent to the inn may be easily made in two hours, but the rambler instead of returning may choose to visit Seisal (a journey from S. Vicente of six hours) or Porto Moniz, passing through Fanal (a journey of eight hours) or Calheta by way of Rabaçal (a journey of eight hours). The Ribeira da Janella is a long valley with innumerable lateral rents and chasms, containing much wood; the scenery is inferior to that of few ravines in the island in respect of variety and grandeur.

From Saõ Vicente to Funchal by the Serra d'Agoa is a ten hours' hammock journey; the scenery for the greater part of the way is of the finest character. The Encumiada Pass (on the ridge connecting Pico Redondo and Pico das Freiras), has a height probably of 4400 feet, and is distant about one hour and three quarters (horseback) from the inn. The chapel rock, at the mouth of the ravine, is distinctly seen from the pass, and in the other direction we look into the head of Ribeira Brava, into which the road descends, and upon the sea beyond. The views are much improved by moving along the ridge for a short distance towards the west. A tolerable road ascends to the Paül da Serra from this ridge. Five minutes below the pass the road to Ribeira Brava and that to Funchal separate. One hour from the pass, the bridge over the main stream of the Ribeiro do Poço is crossed; this ravine, full of beautiful

wood, lies between Pico das Freiras and Pico Grande. The road becomes very narrow, winds round breasts and into gullies, and threads the remains of a forest, still containing many splendid trees, principally Vinhatico, Til, and Louro, with occasional specimens of Aderno, Pao Branco, and Perado. Pico de Fora, on the opposite side of the Serra d'Agoa, is a conspicuous object, with its bare precipitous flanks of rock. The path is carried at Rocha Alta along a narrow shelf cut in the side of Pico Grande, and then comes upon a neck from which we look on one side over bold crags into the Curral, a very grand view, and on the other into the Serra d'Agoa. At this point a path strikes into the Curral; a horse may be led down, but it would be almost impossible to retain one's seat on his back. The road to Funchal finds a passage along the narrow ridge which separates the two valleys, looking first into one and then into the other, until we reach the station previously mentioned, from which visitors from Funchal survey the glories of the Curral.

Calheta.—Good accommodation can be obtained in the house of Snr. Drummond (a Portuguese gentleman of Scotch descent), who inhabits what was formerly a monastery, built on an edge of rock, two or three hundred feet above the *villa*, so narrow that each gable overhangs a ravine. A few days may be agreeably spent at this retired spot

in exploring the neighbourhood; and Snr. Drummond will readily assist visitors in carrying out their plans. The road from Funchal is extremely rugged and tedious to travel, frequently mounting several hundred feet, and then descending to the level of the sea. The best mode of reaching Calheta is therefore by boat; the voyage will occupy from five to seven hours according to the wind. Having left Cabo Giraõ behind we come upon Ribeira Brava, whose village and ravine make a charming picture from the water. At Ponta do Sol, a landing place has been formed by connecting an insulated rock with the shore. The village is a pretty object at the mouth of its ravine. The point being doubled, a long sketch of coast is visible, and Calheta is seen. Magdalena is a village standing at the entrance to a valley, which comes down from the side of Pico d'Urze (4600 feet), and hereabouts the cliffs are very lofty. The Arco de Calheta is a cup-shaped hollow, half of which has been removed. The Pico do Moinho is the highest point of the inclosing ridge; its summit is accessible, and the view from it is good. The church of the Arco is dedicated to Saõ Braz (*i. e.*, Blasius or Blaise.)

The coast between Calheta and Ponta do Pargo is interesting. The landslips of Jardim do Mar and Paül do Mar, both inhabited and cultivated, are passed. A great cleft at the eastern extremity

of the latter, lined with shrubs and grass, amongst which some thread-like streams of water come tumbling down, is one of the finest things on the south coast. A steep path climbs the rocks at the western end of the Paül, and passing the church of Fajaã d'Ovelha joins the road from Calheta to Ponta do Pargo. The point of Fajaã d'Ovelha is formed by a low mass of basalt, in which there is a cavernous opening at the water's edge. The divisions of the rock radiate from the curve and curiously imitate the masonry of our artificial arch. From this point the view extends to Ponta do Pargo, along a wall of lofty cliffs that are frequently rent from top to bottom.

Amongst the excursions by land which may be made from Calheta, we may mention that to Magdalena through the Arco de Calheta; and that through Ribeiro Fundo (which resembles a Scottish Highland glen) and the hamlet of Prazeres to Ponta do Pargo, where the Vigario has a small house which he is willing to let furnished by the week or month. The great object, however, which the traveller will have in view when he visits Calheta, will be the *Fall of Rubaçal*, which may be reached in three or four hours from the inn, taking the tunnel in the way. The views from the mountain's side are very extensive, and embrace a large part of the south-western coast. If the ridge is crossed in place of passing through the tunnel, a grand view

into the Ribeira da Janella is obtained. Instead of returning to Calheta, the rambler may cross the Paül da Serra, and descend upon Saõ Vicente by a road previously mentioned.

Rabaçal has been described in the text explanatory of Mr. Eckersberg's Views in these words:—In one of the thousand recesses at the head of the richly wooded Ribeira da Janella, the waters which trickle down the precipices are collected in a tarn, perched upon a shelf of rock. This little lake is in its turn the source of the celebrated cascade of Rabaçal, which attracts so many travellers from the distant city of Funchal. The place is a piece of pure unsophisticated nature, composed of few elements, but charmingly disposed. The foliage belongs to native laurels and heaths, at whose feet nestles a rich vegetation of grasses, ferns, and mosses, nourished by the ever moist atmosphere. Here may be found specimens of plants which the botanist ranks amongst rare prizes; the large-leafed ranunculus, the anemone-leafed geranium, and the changeable stock. But the objects around are not alone pleasing to the eye of the botanist—the poet and the lover of nature will be enchanted with them. In gay luxuriance the vegetation starts from every crevice, and flowers adorn the grey rocks with their rich and variegated hues, whilst circle within circle, the many-coloured iris plays upon the spray of the descending waters.

CHAPTER XV.

PORTO SANTO—THE DESERTAS—THE SALVAGES.

> What vast foundations in the Abyss are there
> As of a former world !
>
> *Rogers.*

PORTO SANTO is a volcanic island, which lies about 25 geographical miles from Madeira to the N.E., having a length of $6\frac{1}{3}$ miles, and a width of 3 miles. Several uninhabited islets and rocks are in its near vicinity. In 1854, the population amounted to 1708 persons. A lieutenant-governor resides in the *villa* of Porto Santo, which stands on a tract of comparatively level ground on the south side of the island. This tract is covered with a layer of calcareous sand, in which large quantities of dead land-shells are found. The *villa* is a miserable place, with no accommodation whatever for strangers, even during the shortest visit. Persons who betake themselves thither should go provided with all articles of consumption they are likely to require. Bowdich has given an amusing account of a visit

he paid to the island. At the extremities of the island are conical mountains, of which the highest is Pico de Facho, situate at the east end, and attaining an altitude of 1660 feet (Vidal). The highest of those at the western extremity is the Pico de Anna Ferreira, with an altitude of 910 feet (Vidal). The island is an unproductive spot, and is quite bare of trees; so much so, that all the firewood is brought from Madeira. Formerly, 1500 pipes of wine of an inferior quality were annually made here, the largest portion being distilled into brandy, which was employed to strengthen the wines of Madeira. In 1854, the island produced nearly 11,000 bushels of barley, but scarcely any other article of food, the requirements of the inhabitants being mainly supplied from Madeira. The income of the Camara (the whole island forming but one Concelho) amounted to 1154 dollars in the official year 1854-55, whilst the expenditure was 968 dollars. A deficiency of water stands in the way of the cultivation of sugar-cane, *inhame*, sweet potatoes, and other plants. There are only five springs of fresh water on Porto Santo, the other springs being more or less charged with carbonate of soda. Some of the trachyte of the island is sent to Funchal, to be used for building purposes, as it works freely, and has a less sombre colour than basalt. The limestone of Baixo, an adjacent islet, is taken

to Madeira, to be burnt into lime. The tufa of the cliffs which look towards the town of Porto Santo, contains well-preserved marine shells, the remains in the limestone being merely casts or impressions. Many of the plants, land-shells, and insects of Porto Santo are peculiar to it. A rocky reef, lying at an average depth of 25 fathoms, stretches to the north-westward from the northern coast of Porto Santo, for the distance of seven miles and a half.

The discovery of P. Santo took place the year previous to the discovery of Madeira, as already related. When Cada Mosto visited the place in 1445, he saw numbers of dragon-trees, the gum and fruit of which he described. There is not now a single dragon-tree left standing.

In 1595, some English vessels, under Captain Amias Preston, attacked the island in retaliation for ill-treatment previously received. The chief town was burned, notwithstanding the inhabitants offered to ransom it, and the villages were similarly dealt with. The inhabitants have long believed in the existence of an island, somewhere to the westward, which they name Saõ Brandaõ. They imagine that it is occasionally visible; and if a stranger is seen to ascend the hills with any kind of instrument, the rumour immediately runs, that he is going to look for S. Brandaõ.

Mr. Dana points out the fact, that whilst the

trend of Madeira and the Desertas is nearly the same, varying little from N. 66° W., that of Porto Santo is N. 42° E., or within 18° of being at right angles to the former line.

The DESERTAS ("corruptly called Deserters by our seamen," says Forster) are three uninhabited rocks lying to the south-east of Madeira, and at a distance of about eleven miles from the nearest part of the main island, with which they are connected by submarine rocks. The Desertas are fine objects in the seaward views from Funchal, especially in the afternoon, when the light of the evening sun is upon them. The smallest (Ilheo Chaõ), and the largest (Deserta Grande) belong to the Conde de Taipa; Bugio, the most southerly of the three, is the property of the Marquez do Castello Melhor. All of them present nearly vertical precipices to the sea. Deserta Grande reaches the height of 2000 feet, is one mile wide, and six miles and a half long. The Orchil and Barrilla plants are found here, and pine trees have been planted. Rabbits and gulls abound; goats are sent thither to feed during the winter months; grain and vegetables in small quantities are raised by persons who go over from Madeira to sow and gather the scanty crops. Cats, it is said, have become wild at the Desertas, and prey upon the rabbits and young gulls. Seals still inhabit Deserta Grande.

There is a tradition amongst sailors that the singular needle-rock near Chaõ was once fired at by a frigate in a fog, for not replying to her signals, under the impression that it was a vessel.*

The SALVAGES (*Selvagens*) are three uninhabited islands lying between Madeira and the Canaries, in lat. 30 N., and long. 15° 54′ W. The largest is nearly circular, with a diameter of one league and a half, and deriving its name of Great Piton from a cone upon it. One of the other two, distant about three leagues from the largest, also bears a conical hill, and to this the name of Little Piton is applied; its dimensions are half a league by the fifth of a league. The soil of the Great Piton is good, but, being overrun by rabbits, cultivation would be of no avail. At one time it was stocked with cattle, which thrived well on the rich herbage, but these having been piratically removed, the experiment has not been repeated. Orchilla weed and Barrilla were formerly obtained from the Salvages; they ceased, however, to pay the expenses, and the islands are now only visited on account of the birds called Cagarras (Puffinus major,

* Insulated needle-rocks are found in all parts of the world. There is one a few leagues from the coast of Japan, which springs from an unfathomed depth to the height of 300 feet above the water, with a diameter of 250 feet at the base of the visible portion. In the same quarter exists a column of volcanic glass 200 feet high, with vertical sides, and a diameter of 150 feet; this is said to look like a gigantic black bottle.

Temm.) which are very numerous. Twenty thousand, it is said, are annually slaughtered. An oily fat is extracted from the bodies, which are then salted and sold in Madeira, where the flesh is much esteemed by the lower classes. The feathers have also a saleable value. Fish is abundant off these islands, but is left undisturbed. Two peculiar land shells have been found there, and a few species of beetles, one of which is very remarkable. The Salvages belong to Morgado Joaõ Teixeira Cabral de Noronha, who resides at Funchal.

CHAPTER XVI.

ZOOLOGY.

Dans la foule des objets que nous présente ce vaste globe, dans le nombre infini des différentes productions dont sa surface est converte et peuplée, les animaux tiennent le premier rang.—*Buffon.*

THE Fauna of a small island separated by nearly four hundred miles of deep sea from the nearest continent, cannot be expected to include many species of the higher orders of animal existence; and in fact there is reason to believe that, with the exception of some bats, not a single species of land mammal is indigenous. The wild goats and swine mentioned by some of the early voyagers must have made their escape from confinement. The rabbit, black rat, brown rat, and mouse have been introduced, and are now abundant.

The completest list of the birds of Madeira hitherto drawn up, is that printed by Mr. E. V. Harcourt, in the *Annals and Magazine of Natural History* for June 1855. In that list thirty birds are enumerated as breeding in Madeira, and sixty-

eight as stragglers. We take the liberty of reprinting Mr. Harcourt's table, making a single addition to the list of stragglers, and condensing from his paper the remarks that follow. It appears that the only bird which is peculiar to Madeira, is a Wren (*Regulus madeirensis*—Harcourt), which lives amongst the laurels and arborescent heaths in the least frequented parts of the island; and that all the indigenous birds excepting only this Wren, the Chaffinch, and the Swift, are strictly European.

The stragglers come chiefly from the African coast; the most common are the Sparrow Hawk, Greenfinch, Hoopoe, Common Heron, Night Heron, Black-tailed Godwit, Common Curlew, Greenshank, Great Snipe, Gallinule, Coot, Wigeon, and Kittiwake.

Small African birds of rich and variegated plumage are frequently brought to the island by vessels touching at the coast; and good specimens of parroquets, love birds, waxbills, etc., are often to be seen exposed for sale in Funchal, but the prices demanded are not exceeded by those of the London bird dealers.

BIRDS BREEDING IN MADEIRA.

Scientific Name.	English Name.	Portuguese Name.
Falco tinnunculus. *Linn.*	Kestrel.	Francelho.
Falco buteo. *Linn.*	Buzzard.	Manta.
Strix flammea. *Linn.*	Barn Owl.	Coruja.
Turdus merula. *Linn.*	Blackbird.	Merlo-preto.
Sylvia rubecula. *Lath.*	Redbreast.	Papinho.
Sylvia atricapilla. *Lath.*	Black Cap.	Tintonegro.
Curruca Heinekeni. *Jard.*	Variety of Black Cap.	Tintonegro de Capella.
Curruca conspicillata. *Gould.*	Spectacle Warbler.	
Regulus madeirensis. *Harcourt.*	Wren.	Abibe.
Motacella boarula. *Linn.*	Gray Wagtail.	Lavandeira amarella.
Anthus pratensis. *Beckst.*	Meadow Pipit.	Corre do Caminho.
Fringilla butyracea. *Linn.*	Green Canary.	Canario.
Fringilla carduelis. *Linn.*	Goldfinch.	Pinta Silva.
Fringilla petronia. *Linn.*	Ring Sparrow.	Pardao.
Fringilla tintillon. *Webb and B.*	Buff-breasted Chaffinch.	Tentilhao.
Fringilla cannabina. *Linn.*	Greater Redpole or Linnet.	Tinto roxo.
Cypselus unicolor. *Jard.*	Lesser Swift.	Andorinha da Serra.
Cypselus murarius. *Temm.*	Common Swift.	Andorinha do Mar.
Columba Trocaz. *Hein.*	Long-toed Wood Pigeon.	Trocaz.
Columba palumbus. *Linn.*	Ringdove.	Pombo.
Columba livia. *Briss.*	Rock Pigeon.	Pombinho.
Perdix rubra. *Briss.*	Red-legged Partridge.	Perdiz.
Perdix coturnix. *Lath.*	Quail.	Cordonez.
Scolopax rusticola. *Linn.*	Woodcock.	Gallinhola.
Sterna hirundo. *Linn.*	Tern.	Garajao.
Larus argentatus. *Brunn.*	Herring Gull.	Gaio; Goivota, after third moult.
Puffinus major. *Temm.*	Cinereous Shearwater.	Cagarra.
Puffinus Anglorum. *Temm.*	Manks Shearwater.	Boeiro.
Puffinus obscurus. *Temm.*	Dusky Petrel.	Pintainho.
Thalassidroma Leachii. *Temm.*	Leach's Petrel.	Roque de Castro.
Thalassidroma Bulwerii. *Gould.*	Bulwer's Petrel.	Anginho.

BIRDS STRAGGLING INTO MADEIRA.

Scientific Name.	English Name.
Cathartes percnopterus. *Temm.*	Egyptian Vulture.
Falco nisus. *Linn.*	Sparrow Hawk.
Falco subbuteo. *Linn.*	Hobby Falcon.
Corvus corax. *Linn.*	Raven.
Corvus corone. *Linn.*	Carrion Crow.
Oriolus galbula. *Linn.*	Golden Oriole.
Sturnus vulgaris. *Linn.*	Common Starling.
Turdus iliacus. *Linn.*	Redwing.
Turdus musicus. *Linn.*	Common Thrush.
Sylvia hortensis. *Lath.*	Greater Pettychaps.
Troglodytes Europæus. *Selb.*	Common Wren.

Scientific Name.	English Name.
Motacilla alba. *Linn.*	Pied Wagtail.
Alauda arvensis. *Linn.*	Skylark.
Fringilla chloris. *Linn.*	Greenfinch or Grosbeak.
Fringilla domestica. *Linn.*	Common Sparrow.
Cuculus canorus. *Linn.*	Cuckow.
Musophaga Africana. *Temm.*	African Plantain-eater.
Upupa epops. *Linn.*	Hoopoe
Merops apiaster. *Linn.*	Bee-eater.
Alcedo ispida. *Linn.*	Kingfisher.
Hirundo urbica. *Linn.*	House Martin.
Hirundo rustica. *Linn.*	Chimney Swallow.
Hirundo riparia. *Linn.*	Bank Martin.
Caprimulgus Europæus. *Linn.*	European Goatsucker.
Columba œnas. *Linn.*	Stockdove.
Columba turtur. *Linn.*	Turtledove.
Œdicmus crepitans. *Temm.*	Thick-knee.
Calidris arenaria. *Ill.*	Sanderling.
Vanellus crestatus. *Meyer.*	Crested Lapwing.
Charadrius hiaticula. *Linn.*	Ringed Plover.
Charadrius pluvialis. *Linn.*	Golden Plover.
Strepsilus interpres. *Leach.*	Turnstone.
Ciconia nigra. *Temm.*	Black Stork.
Ardea cinerea. *Lath.*	Common Heron.
Ardea ralloides. *Scop.*	Squacco Heron.
Ardea russata. *Wagler.*	Buff-backed Heron.
Ardea purpurea. *Linn.*	Purple Heron.
Ardea minuta. *Linn.*	Little Heron or Bittern.
Ardea stellaris. *Linn.*	Common Bittern.
Ardea nycticorax. *Linn.*	Night Heron.
Platalea leucorodia. *Linn.*	White Spoonbill.
Limosa melanura. *Leisler.*	Black-tailed Godwit.
Numenius arquata. *Lath.*	Common Curlew.
Numenius phæopus. *Temm.*	Whimbrel.
Tringa pugnax. *Linn.*	Ruff.
Tringa subarquata. *Temm.*	Pigmy Curlew.
Tringa variabilis. *Meyer.*	Dunlin.
Tringa cinerea. *Temm.*	Knot.
Totanus hypoleucos. *Temm.*	Sandpiper.
Totanus glottis. *Bechst.*	Greenshank.
Scolopax gallinago. *Linn.*	Common Snipe.

Scientific Name.	English Name.
Scolopax major. *Temm.*	Great or Solitary Snipe.
Crex Baillonii. *Temm.*	Baillon's Crake.
Crex pratensis. *Selb.*	Landrail or Corncrake.
Porphyrio Alleni. *G. R. Gray.*	Allen's Porphyrio.
Gallinula chloropus. *Lath.*	Gallinule or Water-hen.
Fulica atra. *Linn.*	Coot.
Anser segetum. *Steph.*	Bean Goose.
Mareca Penelope. *Selb.*	Wigeon.
Anas crecca. *Linn.*	Teal.
Sterna nigra. *Linn.*	Black Tern.
Sterna Dougalli. *Mont.*	Roseate Tern.
Larus tridactylus. *Lath.*	Kittiwake.
Lestris cataractes. *Temm.*	Skua.
Colymbus glacialis. *Linn.*	Northern Diver.
Sula alba. *Temm.*	Gannet or Solan Goose.
Procellaria alba. *Gould.*	White Petrel.
Procellaria pacifica. *And.*	Pacific Petrel.
Thalassidroma pelagica. *Temm.*	Stormy Petrel.
Prion brevirostris. *Gould.*	Short-beaked Petrel.

The *Kestrel* is here very familiar in its habits, and may be seen perched on the roofs of houses in the very centre of Funchal; it preys upon the common lizard, grasshoppers, and mice, and occasionally succeeds in snatching the tame canary birds from their reed cages as they hang exposed at the open windows. The *common Buzzard* is plentifully met with in the mountains, and the traveller may sometimes come close upon it as he rounds the corner of a projecting rock. The *Barn Owl*, which is somewhat darker than the English barn owl, inhabits some of the more sombre ravines of the island, but it is by no means a numerous species. The *Black Cap Warbler* bears captivity

well, and is to be seen hanging caged at almost every door. The chief difference between the common form and the variety which Sir W. Jardine considered a new species, and named *Curruca Heinekeni*, consists in the extension of the black colour from the cap to the shoulders, sometimes even over all the under parts; the dimensions of this bird and of the common black cap are precisely the same. In the variety the under parts are generally much the same as those of the common female black cap, and the upper parts as those of the common male. The popular belief is, that when the nest of the common black cap contains five eggs, one of them will produce a *Tintonegro de capella*. The Spectacle Warbler is found in brakes and bushes at a somewhat high elevation, and where the solitude is seldom disturbed by man. The *Gray Wagtail* is very common, frequenting tanks, streams, and levadas. The *Meadow Pipit* is plentifully found in the fields near the sea, and in the serras. It utters a low note, running along the ground, and never takes a long flight. The natives consider the bird sacred, and have some legend about its having attended the Virgin at the time of the nativity The *Green Canary* is the original stock of the yellow canary. During the breeding season it is very tame, haunting fearlessly the gardens in the midst of the town. When the breeding season is over it flocks with linnets and other birds, and it

then chiefly frequents the fields and other less populous parts; its song is heard during the greater part of the year. The price of a good singing canary either in Madeira or the Canary Islands, varies from 5s. to 9s., so that, in fact, it may be bought cheaper in London.* The cross between the wild and the tame canary seems to produce a bird which is both physically and vocally stronger than its domesticated ancestors. The *Ring Sparrow*, the only indigenous sparrow in the island, is universally met with on the bleak serras, on trees in the centre of the town, on rocks by the sea, etc.; thus differing in habits, though in nothing else, from the ring sparrow of Europe. The *greater Redpole* or *Linnet* is here very abundant; its only local peculiarity is that of retaining its bright carmine colour throughout the year. The *Lesser Swift* has the tail forked about an inch and a half, and the plumage is darker than that of the common swift. The habits of the swifts in Madeira, differ from those exhibited by birds of the genus in England, and Dr. Heineken has assigned the true reason for the difference. "The swallow and snipe are said to be here periodical visitors, and the reason both for the migratory habits of these birds, as well as for the stationary habits of the swift and woodcock, is very readily to

* Yellow Canaries are imported in considerable numbers from Lisbon for sale at Funchal.

be found, I suspect, in one common cause, namely, *food.* The woodcock finds its food about spring heads, the margins of little mountain rills, etc. These are neither dried up here during our hottest summers, nor frozen in the severest winters. The swifts prey universally on insects, but throughout the summer on a moth which abounds on our most parched and sterile serras. The snipe requires a tolerable quantity of poachy, moist, decomposing soil for the production of its food, and this even in winter is both scarce and very local, whilst at other times there is not a square yard on the whole island and the swallow requires insects which are found only over streams, and something approaching to rivers, which we make but a sorry figure in at the wettest seasons, and are entirely without six months of the twelve." The *common Swift* is not quite so common as the lesser swift. Both species remain in the island throughout the year. The *Ringdove* is an inhabitant of the forests on the north side of the island, and is generally to be found in the Funchal markets. The *Long-toed Wood Pigeon* is more plentiful in Madeira than the Ringdove, and its flesh is considered a great delicacy. A remarkable feature which it possesses, and which points to an adaption for its habitat amongst large forest trees, is the great length of its centre toe, being more than an inch longer than that of the Ringdove. It has a silvery ring which

goes all round the neck, and is darker in its general plumage than the Ringdove. It feeds upon water-cresses, grasses, and the fruit of the laurels and other trees growing in the forests on the north side of the island. The *Rock Pigeon* is plentifully found on the sea cliffs and rocks, and in the ravines all over the island. There is also a variety which appears to be darker in the colour of its feet, and in its general plumage than the common Rock Pigeon. The *Red-legged Partridge* is not uncommon on the wild serras; its running propensities make it difficult of access to sportsmen on even the flattest ground. The *Quail* is more plentiful here than the Partridge, and approaches nearer to the habitations of man; it pairs, laying sometimes as many as sixteen eggs, and bringing off three or four broods a year. The *Woodcock* is found chiefly on the west side of the island, and on the Paül da Serra is very plentiful. The native sportsmen generally shoot it in the evening, when it comes to feed at the mountain rills, and often kill several on the ground at one shot. The *Tern* appears mostly at the Desertas, but occasionally visits parts of the coast of Madeira. The *Cinereous Shearwater* breeds plentifully at the Desertas. This bird and the Manks Shearwater, with which it is sometimes confounded, are salted by the natives for food. The *Dusky Petrel*, another inhabitant of the Desertas, is distinguished from the *Manks Shearwater*

by its smaller size, and by the colour of its feet, which in the latter are of a flesh colour, in the former of a bluish-ash colour. Both may be easily tamed, and will live upon almost anything. They run along the ground on their bellies, and use their curiously shaped bills in climbing up the rocks. In the day time they hide themselves in clefts and holes, issuing out in the evening. *Bulwer's Petrel*, which is common at the Desertas, is easily distinguished from any other Petrel, by having the two central tail feathers elongated. Its plumage is uniformly brownish-black. The *forked-tail Petrel* is also found at the Desertas.

The Seal, which, though now rarely met with, still haunts the caves and clefts of Deserta Grande, has been named *Heliophaca Atlantica*, by Dr. J. E. Gray, who considered it to be the type of a new genus. In the British Museum are stuffed specimens of the animal, one of which is five feet five inches in length. Dr. Gray subsequently obtained the skin and skeleton of a seal of the same species from Algeria. It is related in the old histories that, on Zargo's first visit to Madeira, as his party was journeying along the coast to the west of Funchal, they came suddenly upon some Seals (*Lobos do mar*) which rushed out of a cave and leaped into the sea; whence the name Camara dos Lobos, now borne by the village which stands near the spot.

The reptiles of Madeira are few in number, and

none are poisonous. A small Lizard (*Lacerta Dugèsii*, M. Edw.) is abundant, and caused great destruction to the grapes when such things were. A frog has been imprudently introduced, and is gradually making its way from ravine to ravine. A Turtle (*Caouana Caretta*, J. E. Gray) is frequently captured whilst sleeping on the water, and is cooked for the table, but the soup is much inferior to that made from the green turtle of the tropics, and is moreover a somewhat suspicious article of diet.

The only indigenous freshwater fish of Madeira is an eel, of which several species or varieties are found in the streams up to the height of 500 feet above the sea. The Gold Carp (*Cyprinus auratus*, L.), has been introduced, and is domesticated in tanks in gardens. In papers printed in various scientific publications,* Mr. Lowe, the laborious investigator of the ichthyology of Madeira, has enumerated or described about 186 species of

* *Synopsis of the Fishes of Madeira.* Transactions of the Zoological Society, vol. ii. p. 173. 1841.

Supplement to a Synopsis of the Fishes of Madeira. Trans. of Zoological Soc., vol. iii. p. 1. 1849.

Notices of Fishes newly observed or discovered in Madeira during 1840, 1841, *and* 1842. Annals and Mag. of Nat. History, 1st series, vol. xiii. p. 390. 1844.

An account of Fishes discovered or observed in Madeira since 1842. Annals and Mag. of Nat. History, 2d series, vol. x. p. 49. 1852.

Of Mr. Lowe's work, "*A History of the Fishes of Madeira*," with illustrations coloured from the life, only a few numbers appeared.

marine fishes. Many of these are remarkable for the brilliancy of their colours, or the strangeness of their forms; whilst others are highly interesting to the naturalist for the peculiarity of their structure. The stranger is recommended to visit the fish-market in the early morning, and he is then pretty sure to find something worth notice. The following remarks are transcribed from one of Mr. Lowe's papers previously referred to:—"The European visitor on entering the markets or examining the boats, is struck at once with the almost total absence of the flat fishes, *Salmonidæ*, and cod-fish tribe, which more especially characterize our stalls in England, and with the unwonted forms of the *Sargus*, *Pagrus*, *Pagellus*, *Box*, *Oblada*, *Smaris*, *Thynnus*, *Prometheus*, *Lichia*, etc.; or with the brilliant hues of the *Serranus*, *Beryx*, *Scarus*, etc.; or the grotesque deformed *Scorpæna* and *Sebastes*. The impression will be somewhat different at different seasons. The spring is characterised by the commoner appearance of the splendid-coloured *Beryx* in the streets—attracting notice no less by its form and hues of silver, scarlet, rose, and purple, than by the extraordinary size and opaline, or rather brassy lustre of its enormous eyes. With this, or even earlier, appears abundantly the common Herring of Madeira (*Clupea Maderensis*); and as the season advances, the Mackerel (*Scomber Scombrus*, L.);

the Scarlet Peixe Caõ or Dog-fish of Madeira, *Crenilabrus caninus*; Carneiro, or Mutton-fish (*Scorpæna Scrofa*, L.), and Requieme (*Sebastes Kuhlii*); the Pike-like Bicuda, or Spet of the Mediterranean (*Sphyræna vulgaris*); the Sargo (*Sargus Rondeletii*, Cuv. and Val.) with teeth resembling the human; and the plain-coloured Dobrada (*Oblada melanura*, Cuv.) The Herring and the Alfonsin (*Beryx splendens*) attain the climax of their season about March or April; the Mackerel in May and June; but the whole, except the Herring, continue throughout most part of the summer and autumn. In May the magnificent *Lampris lauta*, the beauty of which in the water excites the admiration even of the fisherman, begins to make its occasional appearance in the market; and, what is of far more importance in an economical point of view, the Tunny fishery begins. This last is at its greatest height in June or July; and to it succeeds the capture of the Gaiado (*Thynnus Pelamys*, L.), which is pursued with such success, that I have sometimes watched a single boat, furnished with scarce half a dozen rods, pulling them at the rate of three or four a minute. With the Gaiado appears in almost equal plenty the Coelho or Rabbit-fish (*Prometheus atlanticus*); and these continue till the close of summer by the equinoctial rains of October. The winter months of January and February are chiefly characterised by the presence,

close along the shores, of the little Guelro (*Atherina presbyter*, Cuv.) or Sand-smelt of Madeira, of the common Madeiran Herring (*Clupea Maderensis*), and Sardinha (*Clupea Sardina*, Cuv.); the two last being captured principally after violent gales and storms, when the swollen rivers or torrents carry down much mud into the sea.

"The following species occur in great profusion, more or less, throughout the year, but still most plentifully in spring and summer, viz., Garoupa (*Serranus cabrilla, Cuv.*); Cherne (*Polyprion cernium*, Cuv. and Val.); Goraz (*Pagellus centrodontus*, Cuv.); Bezugo (*Pagellus acarne*, Cuv.); Pargo (*Pagrus vulgaris*, Cuv.); Boga (*Box vulgaris*, Cuv.); Bocairaõ (*Smaris Royeri*, Bowd.); Ranhosa or Tronbeta (*Lichia glaycos*, Cuv.); Chicharro or Madeiran Horse Mackerel (*Caranx Cuvieri*); Bodiaõ (*Scarus mutabilis*); and Abrotea (*Phycis mediterraneus*, Lar.) The well-known John Dory, or Peixe Gallo (*Zeus faber*, L.), and delicate Red Mullet or Salmoneta (*Mullus surmuletus*, L.), are also taken at all seasons, but more sparingly. The Grey Mullet or Tainha is captured very plentifully throughout the year, but most abundantly perhaps in June." *

The reader will be surprised to learn that there

* In Appendix I is given a list of the fish in most esteem for the table.

have been discovered at the Madeiras nearly 1200 species of insects—

> Each with its busy hum, or gilded wing,
> Its subtle web-work, or its venomed sting;

and in this number the spiders are not included. We state this on the authority of Mr. T. Vernon Wollaston, who has very kindly placed in the editor's hands some notes on the Entomology of Madeira, from which the following information is taken. The results of this zealous naturalist's researches during four visits to Madeira are roughly shewn up to August 1856 in the following

SYNOPTICAL LIST OF MADEIRAN INSECTS.

COLEOPTERA (Beetles)	555
EUPLEXOPTERA (Earwigs)	4
ORTHOPTERA (Grasshoppers, Locusts, Cock-roaches, etc.)	19
THYRANOPTERA (Midges)	6
NEUROPTERA (Dragon-Flies, Ephemeræ, White Ants, etc.)	28
TRICHOPTERA (Caddis-Flies, Water-Moths, etc.)	10
HYMENOPTERA (Ichneumons, Gall-Flies, Bees, Wasps, Ants, etc.)	217
LEPIDOPTERA (Butterflies and Moths) . .	96
HEMIPTERA (Bugs)	54
HOMOPTERA (Cuckoo-Spit Insects, Aphides, etc.)	14
APHANIPTERA (Fleas)	3
DIPTERA (Two-winged Insects, *e. g.* Gnats, House-Fly, etc.)	160
	1166

It must be understood that these numbers are merely approximate; for, in point of fact, only the first of these orders has been hitherto submitted to a searching scientific examination; and until this has been accomplished for the remaining orders, perfect accuracy must not be expected in departments so vast and obscure, each of which requires whole years of labour before our knowledge of them can be said to be even approximately complete.

The exception we have just made relates to the Coleoptera, this order forming the subject of Mr. Wollaston's elaborate work entitled *Insecta Maderensia*,* wherein 483 species of beetles are described. Since the period of its publication, however, the detection of 72 additional species raises the entire number hitherto discovered to 555, which, judging analogically from other countries, cannot be far short of the actual total number there existing. The beetles are everywhere the preponderating order. The Madeiras contain the extraordi-

* "*Insecta Maderensia; being an Account of the Insects of the Islands of the Madeiran Group; by* T. Vernon Wollaston, *M.A., F.L.S.* Van Voorst, London." This splendid volume contains 634 pages, and 13 coloured plates. A learned naturalist writing in the "Annals and Magazine of Natural History," says, of this work, that "it must ever form a prized volume in the entomologist's library from its completeness and its excellence. It is not a mere technical work; it is filled with passages of intense interest to the student of the geographic distribution of animals. It is singularly valuable and important on account of the many detailed descriptions of British genera."

nary number of 555 species, which are included in 12 primary sections, 59 families, and 231 genera, more than 30 of which have not been found elsewhere. The number of species falling under the 12 primary sections are as follows:—

Rhyncophora, 111; *Brachelytra*, 95; *Necrophaga*, 94; *Geodephaga*, 66; *Heteromera*, 46; *Priocerata*, 40; *Cordylocerata*, 45; *Phytophaga*, 23; *Pseudotrimera*, 22; *Philhydrida*, 16; *Eucerata*, 9; *Hydraphega*, 8.

As to the distribution of the species amongst the different divisions of the group, there have been detected in Madeira itself about 493 species, in Porto Santo 156, and on the Desertas 77; whilst only 38 species are common (so far as has been hitherto observed) to all the islands, counting the Desertas as one. About 200 species are either altogether wingless, or have their organs of flight very imperfectly developed, and hence may be inferred, what further investigation establishes, that a large section is of a very *local* character. The genera which contain the largest number of species are *Homalota* with 18 species; *Tarphius* with 17; *Acalles* with 16; *Atlantis* with 14; *Ptinus* with 11, and *Helops* with 10. The type of this section of the Madeiran fauna is in the main Mediterranean; and it is thought to have a greater affinity to the fauna of Sicily than to that of any other country which has been hitherto investigated. A slight

connection with the beetles of Ireland can be traced. One of the striking features of the Coleopterous fauna of Madeira is the absence of numerous genera, and even of whole families, which are looked upon as almost universally distributed. Other remarkable features are that the wood and water beetles are few, and that the flower-infesting tribes are very scarce. As a rule, the beetles of Madeira are obscurely coloured, gay tints being rarely seen. Of the more conspicuous ones, the following species are abundant beneath stones in Madeira. *Scarites abbreviatus*, *Calosoma Maderæ*, *Calathus complanatus*, *Harpalus vividus*, *Laparocerus morio*, and *Hadrus cinerascens*. In Porto Santo and Deserta Grande, the large *Eurygnathus Latreillei* is found under similar circumstances. *Colymbetes Lanio* is common in the streams of intermediate and lofty elevations. In certain districts a bright green *Dasytes* (*D. illustris*), the beautiful *Stenaxis Lowei*, and the *Zonitis 4-punctata* are abundant on flowers. The laurels on the mountains are infested by *Atlantis lamellipes*, *A. noctivagans*, *Blabinotus spinicollis*, and *Trichoferus senex*. Cavernous hollows in the basalt and tufa of the lower regions and the coast are inhabited by *Blaps gages*, *B. fatadica*, *Hegeter elongatus*, and several species of *Helops;* whilst the great *Stromatium unicolor* is too well-known in the houses of Funchal from the destruction its larva causes to

the furniture, on which it chiefly subsists. Before closing this imperfect sketch of Madeiran Coleoptera, it may be well to inform the entomologist that he will find in the British Museum a fine series of type specimens of "Insecta Maderensia," presented by Mr. Wollaston.

Our notice of the remaining orders must, for a reason already stated, be less extended. We understand, however, that in process of time a full account of them may be expected from Mr. Wollaston. In Orthoptera, the common Earwig (*Forficula auricularia*) abounds in all the islands of the group, as well as the large Grasshopper (*Decticus albifrons*), a Cricket (*Gryllus capensis*) and a few Locusts. Two Cockroaches (*Blatta Maderæ* and *B. decipiens*) swarm, one in the houses, and the other in the open country. The common Cricket (*Acheta domestica*) is a vociferous inhabitant of kitchens. The *Mantis religiosa* is an occasional visitor from the coast of Africa.

Amongst *Neuroptera*, two Dragon-flies (*Anax formosa* and *Agrion pumilio*) will be seen darting through the air on a sunny day. Several species of May-flies (*Ephemeræ*) occur. Rotten wood (especially the old stumps of fir and laurel) is burrowed by the White Ant (*Termes lucifugus*).*

* Dr. Hagen of Koenigsberg informs the editor, through their common friend Mr. Hartung, that he has seen 36 species of Neuroptera from Madeira—viz., 2 Termites, 6 Psoci, 4 Ephe-

In *Hymenoptera*, the great families of *Ichneumonidæ* and *Chalcididæ* have many representatives. In the middle region *Ophion obscurus* is abundant; whilst a *Pœlopœus* constructs its mud-nests beneath the eaves, and in the corners of doors and windows of the buildings near Funchal. Several Bees are plentiful; and a Sand-Wasp (*Ammophila*) is extremely common in the highest region, ascending even to the mountain tops.

No one can be long in Madeira before he makes the acquaintance of a very active and troublesome ant, which Professor Heer has named *Œcophthora pusilla*. This naturalist was at the pains to observe minutely the habits of the little creature, and wrote an amusing account of it, a translation of which will be found in Nos. 99 and 100 of the Annals and Magazine of Natural History (March and April 1856). This ant swarms on the south side of the island up to the height of 1000 feet, living in societies composed of four classes, namely, labourers, soldiers, males, and females. The soldiers have remarkably large heads, and the females are winged. The societies live in the ground, under stones, under the bark of trees, and within houses, always preferring a dry, warm locality. In Funchal there is hardly a house that does not harbour millions of

mœræ, 8 Libellulæ, 4 Hemerobides, 3 Myrmelia, and 9 Phryganides; and of these 21 were new species. Dr. Hagen has described the two Termites in his Monograph on the Lion Ants in the *Linnaea Entomologica*, vol. x.

these creatures, which climb to the highest storey, issue in troops out of the smallest chinks in floors and walls, and march in orderly columns to any point which attracts them. They attack everything edible, especially bread, flesh, fruit, and sugar; and it will test all the housekeeper's powers of contrivance to prevent them ravaging her stores. They are most abundant in the dry summer months: after continued wet weather their numbers are perceptibly less.

As to *Lepidoptera*, nine or ten species of Butterfly have been captured, but nearly all are of common European forms. The "Cabbage-White" Butterfly (*Pontia Brassicæ*), the "Clouded Yellow" (*Colias Edusa*), the "Small Copper" (*Lycæna Phlæas*), and the "Red Admiral" (*Vanessa Atalanta*), of England, are seen taking their unsteady flight in the gardens around Funchal. The *Vanessa Callirhöe* and a *Thecla* are also common. The species of Moth are much more numerous, and many of them are strictly endemic; nevertheless, several of the larger *Sphinges* appear to have originated in more northern latitudes. Amongst these may be reckoned the Death's-Head Moth (*Acherontia Atropos*), the Unicorn Hawk-Moth (*Sphinx Convolvuli*), and the Humming-Bird Hawk-moth* (*Macroglossa Stellatarum*).

* Probably it was this insect which sugge-ted to a traveller his story of seeing "humming birds in every garden and on every

Lastly, as to the *Diptera*, an order which as yet has been but imperfectly investigated, it may be sufficient to state that the great *Milesia crabroniformis* (which is peculiar to the Madeiras) occurs during the summer months; that several gnats are abundant, and are at times troublesome, especially the *Culex longiareolatus* (the *Mosquita* of the natives); that the beautiful *Anthrax sinuator* is common in the higher region; and that a *Stomoxys* is extremely annoying during the autumnal heats.

The very marked difference which exists between the land shells of Madeira and Porto Santo does not distinguish the insects of the two islands. Still, besides a certain character in the general fauna, there are many species in Porto Santo which are not found in Madeira. The entomological population of the former seems in fact more akin to the Desertas than to Madeira.

One last word as to the insects, and we have done. The sojourner must not expect to find in the vicinity of Funchal anything like the number of species spoken of above. To realize that, he will have to investigate all the nooks and clefts, all the mountain tops and plateaux, the woods, the ravines, and the coast, of all the islands. Nevertheless, even invalids, who have not strength to wander much beyond the limits of the town,

trellis." Such is the grave statement of the Rev. J. O. Shoules, in his "Cruise of the 'North Star.'"

may procure a large proportion with little exertion, and may thereby help to relieve that feeling of intense *ennui*, of which so many complain during their abode in Madeira.

There are, however, other creatures popularly termed insects, which certainly belong to the great sub-kingdom of ARTICULATA, but which naturalists separate from the scientific class *Insecta*, and place in other classes denominated *Arachnida* (Spiders) and *Myriopoda* (many-footed animals). Of spiders, there are many species existing in Madeira, one of which (*Lycosa tarentuloides maderiana*, Walckn.) is reputed to be poisonous. An *Epeira* (*E. umbratica*, Walckn.) spins its web amongst the Opuntias, and is well known by its stripes of yellow, white, and brown, whence it takes its name of the Zebra Spider. Of the Myriopoda we shall only mention two *Iuli*, which are very abundant in gardens; and the *Cermatia coleoptrata*, Newport, a harmless millepede that makes its appearance on the walls of houses in the evening.

The chief authority on the Land and Freshwater Shells of Madeira is Mr. Lowe, who has enumerated *

* *Primitiæ et Novitiæ Faunæ et Floræ Maderæ et Portus Sancti;* Van Voorst, 1851.

Catalogus Molluscorum Pneumatorum Insularum Maderensium; Proceedings of the Zoological Society of London for 1854.

On the subject of Madeiran Land Shells, see also Mr. Woodward's very useful *Manual of the Mollusca*, pp. 386-7, and Mr. T. V. Wollaston's valuable essay *On the Variation of Species*, pp. 127-132.

155 species. Other naturalists consider some of these to be nothing more than different forms of the same species, and Mr. Wollaston reduces the number of true species to 132 (besides 2 freshwater Molluscs and 7 Slugs), of which 111 are peculiar to the Madeiras; 5 are common to the Canaries; 4 to the Azores; 1 to the Guinea coast; and 11 to the south of Europe. Of the 132 species no fewer than 76 belong to the genus Helix, and 23 to the genus Pupa. Dead shells have been found in large quantities in the calcareous sands of Porto Santo and Point St. Lourenço, the eastern extremity of Madeira. Sixty-four of the living species have been found in this state, along with 13 others, which have not hitherto been found alive. Of the whole number, 70 species are peculiar to Madeira (out of 92 species found there), whilst out of the 54 species found at Porto Santo, 39 are peculiar. When we remember that Great Britain does not possess a single peculiar species of land-shell, it must strike us as a very remarkable circumstance that small islands like Madeira and Porto Santo should contain so many.

It is very singular that only three shells are common to all the islands of the group (considering the Desertas as one island), and hardly less singular that Madeira and Porto Santo have only eleven shells in common, and four of these are species of general diffusion. In comparative general charac-

ters the *Helices* of Madeira and Porto Santo are said to have as little in common as in identity of species; those of Madeira being, generally speaking, sylvan species, whilst those of Porto Santo are characterised by the thickness and roughness of their shells. Even in the case of species dwelling in both islands, the specimens from each locality are recognizable as distinct races or geographical varieties. In Porto Santo the *Helices*, in a majority of the species, swarm together in particular spots, whilst in Madeira this peculiarity is only observable in two or three kinds. The season of the activity of the gregarious species is the winter; in Britain it is the summer. Another remarkable circumstance is, that in regard to land-shells, Madeira has very little connection with the Canaries, which have actually more species in common with the south of Europe than Madeira has. Madeira seems to stand isolated in great measure with respect to both.

If we descend to the shore we shall find the rocks between high and low water mark studded with Periwinkles (*Littorinæ*), Whelks (*Trochi*), Limpets (*Patellæ*), Chitons, and *Balanidæ*.* Near the line of low water there is a fringe of green sea-weed, chiefly *Porphyra* and *Enteromorpha*, and below this another fringe of short olive and red

* In Mr. Darwin's Monograph on the Cirripedia, it is stated that six species of *Balanidæ*, and seven species of *Verrucidæ* and *Lepadidæ* have been found at Madeira.

Algæ, consisting principally of *Laurencia pinnatifida*, *Cystoseira barbata*, *Rytiphlœa tinctoria*, *Sphacelaria scoparia*, and *Halyseris polypodioides*, intermixed with the stony *Corallina officinalis*, and occasionally a curiously folded *Padina*. The marine flora of Madeira is, however, very poor in the number and the luxuriance of the species. In pools will be found Sea Urchins (*Echinus lividus*, Lam., and *Brissus dimidiatus*, Ag., are common species), Sea-Anemones (chiefly *Actinia flagellifera*, Dana), and Hermit Crabs (*Paguridæ*). Other species of Crustacea are found in deep water, such as *Grapsus pictus*, *Plagusia squamosa*, *Leptopodia sagittaria*, *Scyllarus latus*, and *Palinurus vulgaris*, as well as the common Shrimp (*Crangon vulgaris*), and a Prawn (*Palæmon squilla*). But the finest of all is a Lobster (*Homarus Cuvieri*), remarkable for the length of its claws and legs.

The *Entomostraca* have not been fully examined, but a few species (8) have been described by Dr. S. Fischer, in the Transactions of the Royal Bavarian Academy of Sciences for 1855.

In deep water are also found star-fish belonging to various genera, long-spined Urchins and Sea-cucumbers (*Holothuriæ*). Sea-slugs, Sea-hares, and Sea-lemons, creatures feeding upon sea weed or zoophytes, and belonging to the genera *Doris* *Æolis*, *Peplidia*, *Aplysia*, etc., may occasionally be captured.

Mr. M'Andrew has given a list* of 156 species of marine testaceous Mollusca, which he obtained whilst dredging for a few days off the coast of Madeira. Of this number 54 species belonged to Acephala lamellibranchiata, and 90 to Gasteropoda prosobranchiata. Nearly 45 per cent of the species are common to Madeira and the British seas; whilst 70 per cent are common to Madeira and the Mediterranean and Peninsular coasts. All the Madeiran species were found at the Canaries, with the exception of 27. The genera most largely represented are those of Tellina (5), Cardium (5), Lucina (4), Pecten (8), Hyalœa (4), Patella (6), Trochus (6), Rissoa (5), Murex (5), Mangelia (9), Mitra (4). It is very remarkable that although the prevailing set of the oceanic currents is eastward, only three Madeiran species have been recognised as North American. Mr. M'Andrew informs the editor that he dredged only three or four times, and that his list can only contain a portion of the Mollusca of Madeira, which presents a field where the future researches of naturalists may be amply rewarded.

Amongst the. *Cephalopoda*, several species of Cuttle-fish are occasionally taken, such as *Octopus vulgaris*, Lamk.; *O. Cuvieri*, D'Orb; *Loligopsis pavo*, Le Sueur; *Loligo vulgaris*, Lamk, and *Sepia*

* *On the Geographical Distribution of Testaceous Mollusca in the North Atlantic and Neighbouring Seas.* By Robert M'Andrew. 1854.

officinalis, Linn. The beautiful shell of the Paper Nautilus (*Ocythoe tuberculatus*, Raf.), is sometimes stranded.

Delicately tinted Portuguese Men-of-war (*Physalia azorica*, Less., and *P. pelagica*, Less.), are sometimes thrown on shore in abundance, and more rarely the Sallee-man (*Velella mutica*, Less.)

Several interesting forms of Zoophytes and Sponges reside here. Amongst the former is a red coral (*Dendraphyllea ramea*, Blain.), and a white coral (*Cladocora debilis*, M. Edw.), as well as species of *Gorgonia* and *Virgularia*.

CHAPTER XVII.

BOTANY.

Long work it were
Here to recount the endless progeny
Of all the plants that bud and blossom there;
But so much as doth need must needs be counted here.
Faerie Queene.

THE appearance of the island when it was first discovered induced the Portuguese to give it the name of *Madeira*,* to indicate the abundance of wood that clothed it. Whether or not there is any truth in the story of the fire which is said to have broken out soon after the landing of the discoverers; to have driven them by its violence to their vessels; and to have remained unextinguished for seven years, certain it is that the native wood has almost entirely disappeared from the south side, and if we would now see characteristic spe-

* One of the great feeders of the River Amazons received the name of *Madeira* from the forests that cover its banks. Like the great majority of Portuguese words, Madeira had a latin origin. The phrase, *materiam cædere*, to fell timber, is met with in the writings of several Roman authors; and in Cæsar's account of Britain there occurs the statement "Materia cujusque generis, ut in Gallia est; praeter fagum et abietem."

cimens of it, they must be sought for in the centre of the island or in the valleys of the north. Several of the ravines on that side of the island are filled with an arborescent vegetation of indigenous growth, and many groups of noble trees may still be seen in Ribeiro Frio, Boa Ventura, and Ribeira da Janella. In the Serra d'Agoa, a ravine in the interior, but on the south side of the central crest, there are also the remains of an ancient forest; and the road from Funchal to Saõ Vicente, in conducting the traveller through it, brings him within sight of many large trees of fantastic growth or striking beauty.

LIST OF THE NATIVE TREES AND LARGER SHRUBS OF MADEIRA.

Botanical Name.	Natural Order.	Madeiran Name.
‖Dracæna Draco. *L*	Liliaceæ.	Dragoeiro.
‖Juniperus oxycedrus. *L.*	Coniferæ.	Cedro da Serra.
*Taxus baccata. *L.*	...	Teixo.
‖Myrica Faya. *Ait.*	Myricaceæ.	Faya.
‖Salix canariensis. *L.*	Salicaceæ.	Seixo.
‖Phœbe barbusana. *Webb.*	Lauraceæ.	Barbusana.
†Persea indica. *Spreng.*	...	Vinhatico.
‖Oreodaphne fœtens. *Nees.*	...	Til.
‖Laurus canariensis. *Webb.*	...	Louro.
**Clethra arborea. *Ait.*	Ericaceæ.	Folhado.
†Erica arborea. *L.*	...	Urze molàr.
†Erica scoparia. *L.*	...	Urze durázia
‖Vaccinium maderense. *Link.*	Vacciniaceæ.	Uveira da Serra.
‡Sideroxylon mermulana. *Lowe.*	Sapotaceæ.	Mermulana.
‖Heberdenia excelsa. *Ait.*	Myrsinaceæ.	Aderno.
*Sambucus ebulus. *L.*	Caprifoliaceæ.	Sabugeiro.
*Sambucus nigra. *L.*	...	
Picconia excelsa. *D C.*	Oleaceæ.	Pao branco.
‖Olea europæa, *L. var.* maderensis. *Lowe.*	...	
†Myrtus communis. *L.*	Myrtaceæ.	Murta.
‖Euphorbia mellifera. *Ait.*	Euphorbiaceæ.	Alindres
Rhamnus glandulosa. *Ait.*	Rhamnaceæ.	Sanguinho.
Celastrus cassinoides. *L'Her.*	Celastraceæ.	Buxo da rocha.
‖Ilex perado. *Ait.*	Aquifoliaceæ.	Perado.
‖Ilex canariensis. *Poir.*	...	Azevinho.

Botanical Name.	Natural Order	Madeiran Name.
‖Pittosporum coriaceum. *Ait.*	Pittosporaceæ.	Mocaim.
*Pyrus aucuparia. *Gaertn.*	Rosaceæ.	
†Prunus lusitanica. *L.*	...	Gingeira brava.
‡Genista candicans. *L.*	Leguminosæ.	Giesta brava.
**Genista virgata. *D. C.*	...	Piorno.
†Adenocarpus intermedius. *D.C.*	...	

Those species to which an * is affixed are found in Britain; those with a † are known on the continent of Europe; those with ‖ are found at the Canaries and Azores, or at one of these groups; the one with ‡ is only found elsewhere at the C. Verdes; and those with two ** are peculiar to Madeira.

The highest peaks of the island are bare of all but lowly forms of vegetation; but having descended a few hundred feet, we enter a district which is clothed with heaths and bilberry. Below this is the region of forest trees, which shelter themselves in ravines and protect a rich cryptogamic flora of ferns and mosses.

Of the trees, the Vinhatico, the Til, and the Cedro are in much request by the cabinet-maker, the first yielding a red wood, known as Madeira mahogany; the second a handsome wood of a dark hue, that takes a good polish, and the last a soft wood with an agreeable scent, that induces him to line drawers and boxes with it. The ceiling of the cathedral at Funchal was formed of this wood. Of late years the tree has become very scarce. Newly cut Til has a strong fœtid smell, and hence only well-seasoned wood should be used for furniture. The beams and joists of old buildings supply a good deal of that worked up at present by the cabinet-maker. From the ripe berries of the Louro, an oil is extracted by boiling, which

the peasants consume in lamps. The Folhado is a beautiful object in the height of summer, when full of panicles of white sweet-smelling flowers. Its wood is tough, and of very light weight, qualities that cause it to be employed for hammock-poles. By far the strangest in appearance of the indigenous trees is the Dragon's Blood tree, which has become so rare that scarcely half-a-dozen specimens can be found wild on the whole island. A small quantity of red fluid exudes when the stem is wounded, and hence the origin of its name. The Dragon's Blood of commerce, a substance employed to colour tooth powder and varnishes, is principally obtained from a family of East Indian palms. This tree also is said to yield in India a similar substance, but in Madeira the quantity of exudation is so extremely small and the trees so few, that no attempt is made to gather it. No Dragon tree in Madeira is at all equal in size to the famous tree at Orotava, in Teneriffe, which has employed so many pens and pencils in its delineation. The Bilberry and Heaths cover large tracts upon the mountains, where they attain to the size of small trees. It is not unusual to see specimens of the latter more than twenty feet high, sometimes, indeed, thirty feet high, and occasionally trunks may be met with measuring seven feet in girth. There exists a law against the cutting down of trees on the *serra* without the permission

of the authorities, but this regulation has been habitually neglected, to the great damage of the native woods, and at the risk of diminishing the supply of water so necessary to the agriculture of the island.

The native shrubs most remarkable for beauty of flowers or foliage are *Echium fastuosum* (Pride of Madeira), which adorns the sea-cliffs with its racemes of blue flowers in March; *Myrtus communis*, *Celastrus cassinoides*, *Genista candicans*, *Convolvulus Massoni*, and several species of *Hypericum*. These may be found not far distant from Funchal; but the following must be sought for amongst the mountains, the three last being very rare—*Echium candicans*, *Chrysanthemum pinnatifidum*, *Carlowizia salicifolia*, *Sonchus squarrosus*, *S. pinnatus*, *Melanoselinum decipiens*,* *Teucrium heterophyllum*, and *Isoplexis sceptrum*. *Jasminum odoratissimum*, a shrub with yellow flowers and polished leaves, is also rare, its usual habitat being rocks near the sea. A handsome shrubby Euphorbia (*E. mellifera*), is found in tolerable abundance in ravines at the north. Another shrubby plant of the same genus, *E. piscatoria*, loves hot and dry rocks on the south side. Three climbers of considerable elegance

* "*Melanoselinum decipiens*, Hoffm., which is sometimes upwards of 10 or 12 feet high, and which has been introduced into our gardens from Madeira, belongs to a peculiar group of arborescent umbelliferous plants, and it is still almost entirely alone as an umbelliferous tree."—*Humboldt's Aspects of Nature.*

should not remain unnoticed; these are the Alexandrian Laurel (*Ruscus androgynus*), *Smilax pendulina*, and *Asparagus scaber*. On the sea-cliffs to the east of the town a Lavender (*Lavandula pinnata*) is common; another Lavender (*L. viridis*) grows on the hills above. On the sea-cliffs both east and west of Funchal, will be found *Matthiola maderensis* (the Madeira Stock), *Hyoscyamus alba* (the Henbane), *Olea maderensis*, the snowy-leaved *Helichrysum obconicum*, and *Lotus glaucus*; also, but more rarely, *Sideroxylon mermulana*, *Chamæmeles coriacea*, and *Ephedra alata*. On the cliffs at or near Cabo Giraõ, and Cabo Garajaõ, there will be noticed *Genista virgata*, *Musschia aurea*, *Prasium majus*, and *Sedum fusiforme*. At the latter station the rare *Tamus edulis* may be found amongst the rocks; at the former grow the silvery-foliaged *Artemisia argentea*, and *Prasium medium*.

Of the native herbaceous plants we may point out a Geranium (*G. anemonifolium*), and a Ranunculus (*R. grandifolius*), which like damp and cool situations in the laurel woods of the interior; the pretty Madeira Saxifrage (*Saxifraga maderensis*), also a lover of damp spots on rocks and walls; the lovely *Amaryllis Belladonna* that fills the chestnut woods of the north with flowers in August; a Gladiolus (*G. segetum*) which flowers in the fields near Funchal in February the Star

of Bethlehem (*Ornithogalum arabicum*) that adorns the vineyards in April and May, with its white cup-shaped flowers; and the Cape Gooseberry (*Physalis Peruviana*) which is common in the roads near Funchal, as well as in the woods of the interior. The commonest Houseleek is *Sempervivum glutinosum;* another one, *S. tabulæforme*, studs the rocks of the interior with flattened leaves arranged in round rosettes. The commonest of the three native Stonecrops is *Sedum nudum*. In the early spring the Sweet Violet, which is thought to be undistinguishable from the British *Viola odorata*, is abundant on the hills, and is brought daily for sale into Funchal. The most remarkable features of the mountain vegetation is the abundance of four Laurels; and the quantity of Heath and Bilberry clothing the hills above the forest region. In open places on the mountains a blue Lobelia (*L. urens*) and a pretty Loosestrife (*Lythrum junceum*) are in flower during summer. In shady places a Squill (*Scilla hyacinthoides*) and four *Orchideæ* are found, the commonest of which is *Orchis foliosa*. An undescribed species of *Campanula* has lately been found amongst the mountains; it is very rare, bears handsome flowers and foliage, and becomes in time almost a shrub. A creeper (*Sibthorpia peregrina*) with a rounded leaf and a small yellow flower carpets the valleys of the north. A new umbelliferous plant with elegant foliage was lately dis-

covered at the Desertas, which Mr. Lowe proposes, we believe, to name *Monizia edulis.** Dyes are obtained from the Madder (*Rubia tinctorum*) and the Woad (*Isatis tinctoria*). A blue-flowered Commelyna (*C. agraria*) is common in damp places in the lower region, furnishing food for cattle and goats. Amongst the grasses *Briza maxima*, with its flowers in pendent knots, will hardly escape notice. Several flowers will remind the rambler of England; for example, the Celandine, Foxglove, Broom, Furze, Honeysuckle, Dog-rose, Periwinkle, Cranesbill, and Forget-me-not; but he will search in vain for those well known plants the Primrose, Cowslip, Speedwell, Snowdrop, Hairbell, Meadow Sweet, and Anemone. He must be very fortunate if he meets with a Daisy, for the "wee crimson-tipped flower" is not indigenous, and is scarcely yet naturalized in Madeira.

In a climate like that of Madeira the process of naturalization is very rapid; and there can be no doubt that many of the plants which seem to be indigenous in the lower region have been introduced since the advent of man. In several instances the first introduction of well established plants is within the recollection of persons still living;

* In compliment to Snr. J. M. Moniz, of Funchal, who has devoted himself to an investigation of the native flora, and who deserves well of his country for his disinterested efforts to improve the agriculture of the island.

and those who have resided for a few years on the island are able to trace many species from gardens to the open country. To mention a few cases, a scarlet *Pelargonium*, the *Salvia pseudo-coccinea*, *Fuchsia coccinea*, *Acacia glauca*, *Lycopersicum esculentum*, *Richardia æthiopica*, *Ricinus communis*, and *Psidium pomiferum*, are growing in certain places like wild plants. In more than one valley of the north the white Trumpet Flower (*Brugmansia suaveolens*) has established itself. Indeed, certain exotics have become so far naturalised as to seem part of the indigenous vegetation. The Apple of Sodom (*Solanum Sodomæum*) with prickly leaves and purple flowers, grows on the shore in Funchal Bay. *Cassia bicapsularis*, with yellow flowers and a turgid pod, is not uncommon on the sea-cliffs. The Pomegranate (*Punica granatum*) puts forth its rich scarlet blossoms in April in the hedges near Funchal. The red flowers of *Lantana aculeata* may be seen in the roads at every season. The pendent flowers of a willow-like shrub, the Madeira Silk-plant (*Gomphocarpus fruticosus*), appear in November. In the early spring the pink flowers of an *Oxalis* adorn the vineyards and roadsides, though introduced as a garden flower only a few years ago. The *Aloe vulgaris* and *Agave americana* grow in a few places near the town; whilst a species of Cactus (perhaps *Opuntia Tuna* DC.) is so abundant in the lower region, as to

give a peculiar feature to the rocky parts of the landscape. This is the plant upon which the cochineal insect is reared with such beneficial results at Teneriffe. The merchants of Funchal are turning their attention to the same branch of industry, in the hope of its ultimately becoming a remunerative substitute for the vine. If the poor cottagers could be induced to rear the insect on the plants that grow near their doors, they might add considerably to their comforts; but they prefer gathering the fruit (the prickly pear) which is produced abundantly during the summer, and which the insect injures.

The localities in the immediate neighbourhood of Funchal, which will best repay the botanist in search of native plants, are those already indicated, the Waterfall Ravine, and the ravine of Joaõ Gomez, the upper part of which is usually called the Little Curral.

If we keep out of view the plants which have been introduced and become more or less naturalised within the last few years, it is believed that the flowering plants of the Madeira group belong to about 364 genera and 650 species, the Monocotyledons numbering 72 genera and 122 species, the Dicotyledons 292 genera and 528 species. The proportion of Monocotyledons to Dicotyledons is therefore as 10 to 43. The orders which contain the greatest number of species are *Compositæ*

with 86, *Leguminosæ* with 72, *Graminaceæ* with 66, *Labiatæ* with 36, *Cruciferæ* with 32, *Umbelliferæ* and *Scrophulariaceæ* each with 21, and *Caryophyllaceæ* with 17 species. The proportion of Ferns to flowering plants is about 1 to 16. The number of species peculiar to the Madeiras is between 80 and 90. In addition to these there are about 110 species which are peculiar to Madeira and other islands of the northern Atlantic. It is very remarkable that whilst fully two thirds of the phanerogamous flora are common to the region of the Mediterranean, not one of the peculiar plants of the Peninsula is found in Madeira. The large proportion of South European plants in Madeira, has been adduced as evidence to support the hypothesis that there was in ancient times a land communication between the south of Europe, north of Africa, and the islands in the northern part of the Atlantic Ocean.

The Canaries possess a much greater number of peculiar plants than the Madeiras, as might be expected from their higher temperature, and the greater variety and extent of their surface. On the other hand, the Azores (as yet, it is true, imperfectly examined) are poor in peculiar plants. Until the flora of the neighbouring continent of Africa has been investigated, there must necessarily be much obscurity as to the origin and affinities of the indigenous plants of these groups.

Estimating the number of species of flowering plants and vascular cryptogamics found at the Madeiras at 784, Professor Heer has given the following statistical analysis with reference to their geographical distribution. Deducting the thirty species which have been found in Porto Santo, and not in Madeira, of the remaining 754 species, 65 have evidently been introduced, and 162 are found only as weeds, and cannot be counted as truly native. Of the remaining 527 species, 85 are peculiar to Madeira, 6 to Madeira and Porto Santo, 40 to Madeira and the Canaries, 9 to Madeira and the Azores, 12 to Madeira, the Canaries, and the Azores, and 2 to Madeira, Porto Santo, and the Canaries. Deducting, then, the plants peculiar to the Atlantic Islands, there remain 373 species, of which 7 are found on the African continent, and at the Cape Verde Islands, 4 on the American continent, 3 in the Tropics of Asia and America, and 359 in Europe. Of the 359 European species, 223 have not been found in other quarters of the globe, 78 are common to Europe and North Africa, 19 are common to Europe, North Africa, and Asia, 8 are common to Europe and Asia, 2 are common to Europe, Africa, and America, 5 are common to Europe, Asia, and America, and 23 are cosmopolites.

"The general character of the vegetation of Ma-

deira (remarks Mr. Lowe *) is in correspondence with the equivocal geographical position of the island. It is a type intermediate between the forms of the south of Europe bordering on the Mediterranean basin, more particularly on the African or southern side) and those of the Canary Islands. Comparing it with the vegetation of more northern Europe, the most striking features are the presence, by naturalization, in the lower maritime regions, of tropical forms, such as the Banana, Prickly-pear, Date-palm, Rose-apple, etc., and the almost utter absence, in the higher parts of the island, of the alpine. Comparing it again with the vegetation of more tropical Africa, we have, higher up the country, forests of Laurels and Whortleberry (*Vaccinium padifolium*, Sm.) in the place of *Adansoniæ* and Palms; grassy mountains instead of those sandy plains, whose only plants are a few wretched *Zygophylla* or *Mesembryanthema*; Brooms and Myrtles feathering the hills and the precipitous sides of the ravines, in exchange for the lonely bushes of Tamarisk, *Capparis*, *Acacia*, or *Mimosa*, which sprinkle the arid wastes and rocky defiles of the Mauritanian or Arabian deserts; whilst a few shrubby *Euphorbiæ*, *Semperviva*, and *Seda*, but scantily represent those vast succulent

* Primitiæ et Novitiæ Faunæ et Floræ Maderæ et Portus Sancti. By the Reverend R. T. Lowe, M.A., Van Voorst, London, 1851.

tribes of *Euphorbiaceæ*, *Crassulaceæ*, and *Asclepiadeæ* of more southern Africa."

It may be interesting to compare the number of flowering plants found wild in the Madeiras with the numbers stated to have been found in other islands in the Atlantic. In the Canaries there have been collected 974 (*Webb*), in the Azores 420 (*H. C. Watson*), in the Cape Verde Islands 420 (*Schmidt*); at St. Helena 746 (*Darwin*). Of the St. Helena plants it is stated that only 52 are native species, all the rest have been imported.

The Cryptogamic flora, with the exception of the ferns, has not been well investigated. Prof. Heer states that out of a collection of sixty lichens, eight species only were new, and these are probably peculiar to Madeira; out of 26 Algæ, six were new and peculiar; and out of 21 Mosses, three were peculiar to the Atlantic islands and Africa, the rest being European. A Lycopodium (*L. denticulatum*, Willd.) is abundant in damp and shady places; another Lycopodium (*L. suberectum*, Lowe) is rare. *Equisetum fluviatile*, L., is common in moist ground.

Forty, or perhaps forty-one species of fern, some scarce, others very abundant, have been found upon the island, and of these about twenty are thought to correspond with British species, whilst only three are peculiar to Madeira.

LIST OF FERNS INDIGENOUS IN MADEIRA.

NAME.	SYNONYMS.	HABITAT.
† Ophioglossum lusitanicum. *L.*	... ...	Rare—Alegria; Ponta do Pargo.
* Polypodium vulgare. *L.*	... ...	Common.
§ Polypodium drepanum. *Lowe.*	Aspidium drepanum. *Sw.*	Rare—Serra d'Agoa; S. Vicente, etc.
† Nothoclæna lanuginosa. *R. Br.*	... ...	Old walls, Funchal.
† Nothoclæna Marantæ. *R. Br.*	... ...	Rare—stony places in ravines.
* Gymnogramma leptophylla. *Desv.*	... ...	Not uncommon — damp shady places in ravines.
‡ Gymnogramma Totta. *Schlecht.*	G. Lovei. *Hook. et Grev*	Not uncommon — shady ravines
‡ Elaphoglossum muscosum. *J. Sm.*	Acrostichum squamosum. *Sw.* A. paleaceum. *Hook. et Grev*	Rare—trunks of old *Lauri.*
† Cheilanthes fragrans. *Sw.*	Ch. madereusis. *Lowe.*	Old walls in and near Funchal.
* Adiantum Capillus-Veneris. *L.*	A. maderense. *Lowe.*	Common—lower region.
‖ Adiantum reniforme. *L.*	... ...	Not uncommon — damp rocks.
* Pteris aquilina. *L.*	... ...	Common.
‖ Pteris arguta. *Vahl.*	... ...	Common—on S. side, only in shady ravines.
* Blechnum boreale. *Sw.*	Lomaria spicunt. *Desv.*	Common.
† Woodwardia radicans. *Sm.*	... ...	Plentiful—north side.
* Scolopendrium vulgare. *Sym.*	S. officinarum. *Sw.*	Rare—ravines.
* Asplenium marinum. *L.*	... ...	Not very common—more abundant north side; Ponta delgada; S. Vicente, etc.
* Asplenium anceps. *Lowe.* (1)	... ...	Common.
‡ Asplenium monanthemum. *L.*	... ...	Rare—south side; more abundant at the north.
‡ Asplenium palmatum. *Lam.*	... ...	Rare—south side; less uncommon at the north; S. Vicente; S. Anna, etc.
* Asplenium acutum. *Bory.*	A. Adiantum nigrum. *L.* *Var.* acutum. *Newm.* A. productum. *Lowe.*	Abundant below 4000 feet.
* Asplenium lanceolatum. *Huds.*	... ...	Not uncommon—walls and clefts in rocks.
‡ Asplenium canariense. *Willd.*	A. furcatum. *Sw.*	Rare—south side; not uncommon at the north; S. Anna; Ponta delgada, etc.
‖ Asplenium umbrosum. *J. Sm.*	Allantodia umbrosa. *R. Br.*	Damp shady ravines, S. Vicente, Boa Ventura, etc.
‖ Asplenium axillare. *J. Sm.* (2).	Allantodia axillaris. *R. Br.* Aspidium axillare. *Willd.*	Damp shady ravines.

NAME.	SYNONYMS.	HABITAT.
* Athyrium filix-fœmina. *Roth.*	Asplenium filix-fœmina. *L.*	Common—damp places.
* Ceterach officinarum. *Willd.*	Gymnogramma Ceterach. *Spreng.*	Not common—walls and rocks near Funchal.
‡ Nephrodium molle. *R. Br.*	Aspidium molle. *Link.*	Abundant on south side below 1200 feet.
* Cystopteris fragilis. *Bernh.*	... ...	Common in damp places below 3500 feet.
* Lastrea affinis. *J. Sm.* (1).	Nephrodium affine. *Lowe.*	Not very common—usually found at a considerable elevation.
† Lastrea elongata. *J. Sm.*	Nephrodium elongatum. *Lowe.*	Common in damp shady places on the mountains.
* Lastrea Oreopteris. *Presl.*	... ...	Abundant near the Lamoceiros; Rib. Frio.
* Lastrea Fœniseccii. *H. Wats.* *Var. a.* alata. *Lowe.* *Var. β.* producta. *Lowe.*	Aspidium æmulum. *Sw.* Aspidium spinulosum. *Willd.* *Var. γ. Hook. et Arn.* Nephrodium fœniseccii. *Lowe.*	Abundant on the mountains above 3000 feet.
* Lastrea dilatata. *Presl.*	Aspidium dilatatum. *Willd.*	S. Antonio da Serra.
* Polystichum angulare. *Presl.*	Aspidium angulare. *Willd.*	Common.
§ Polystichum falcinellum. *Presl.*	Aspidium falcinellum. *Sw.*	Local — Torrinhas Pass; Curral; Pico Ruivo; Paul da Serra; Serra d'Agoa; Arrebentaõ.
§ Polystichum frondosum. *Presl.* (3).	Aspidium frondosum. *Lowe.*	Woods and dry shady rocks.
† Davallia canariensis. *Sm.*	... ...	Everywhere abundant.
* Trichomanes radicans. *Sw.*	T. speciosum. *Willd.*	Damp woods between 2000 and 4000 feet; not common—Rib. frio; Boa Ventura; S. Vicente, etc.
* Hymenophyllum Tunbridgense. *Sm.*	... ...	Damp woods at a considerable elevation.
‖ Dicksonia culcita. *L'Herit.*	... ...	Rare—on elevated serras; Fanal; Boa Ventura, etc.

* British species. † Species found on the continent of Europe. ‡ Species found on the continent of America or in the West India Islands. § Species peculiar to Madeira. ‖ Species peculiar to Madeira, and other islands of the N. Atlantic.

(1) Mr. J. Smith, of the Royal Gardens, Kew, a leading authority on the subject of ferns, informs the editor that an examination of specimens from various quarters of the world induces him to consider the *Asplenium anceps* of Mr. Lowe to be only a form or variety of *A. Trichomanes*, L., and the *Nephrodium affine* of Mr. Lowe to be similarly related to *Lastrea Filix-mas*, Presl. The Madeira form has been found in North Wales. (2) It is possible that the *Asplenium axillare* of Madeira may be only a form of *A. umbrosum*. (3) *Polystichum frondosum*, Presl., has been hitherto cultivated at Kew under the name of *P. æmulum*.

CHAPTER XVIII.

GEOLOGY.

The solid earth whereon we tread
In tracts of fluent heat began.

Tennyson.

THERE has been much speculation of late years amongst scientific men touching the former existence of a continent which is supposed to have occupied, at some period geologically modern, a great part of the northern Atlantic, and to have connected the Azores, Madeiras, Canaries, and Cape Verdes with Europe, Africa, and perhaps America, until it subsided beneath the waves of the ocean, leaving only a few of its loftier summits in the shape of islands, as the scanty salvage of the great wreck. The late Professor Edward Forbes eagerly adopted the idea, and threw as much light upon it as the scanty data at his command allowed.* Geologists, botanists, and natura-

* See a paper on the "Origin of the Fauna and Flora of the British Isles," printed in the first volume of the Memoirs of the Geological Survey of Great Britain; also a paper read before the Meeting of the British Association, 1851, on "Some Indications of the Molluscous Fauna of the Azores and St. Helena."

lists have since been collecting facts bearing upon the question, but evidence sufficiently strong to afford a firm foundation for the hypothesis does not appear to have been hitherto obtained; and it still remains little more than a conjecture, to which only those who have carefully examined the facts can assign the rightful degree of probability.

The archipelago of Madeira appears, from Lieut. Maury's soundings, to rise in the middle of a narrow oceanic trough, which has a depth ranging from 13,200 feet to 16,800 feet; whilst the Canaries, on one side, and the Azores on the other, stand upon floors much less deeply submerged, the ocean around these groups varying in depth from 7200 feet to 10,800 feet.*

The great mass of Madeira is of volcanic origin. The foundation of the island may have been either laid under the sea or pushed through the floor of a continent; and two distinct causes, operating in some degree contemporaneously, have contributed to its present elevation. First, a long and complicated series of eruptions gradually piled up a mass of basalt, tuff, cinders, ashes, etc., to the height of between 4000 and 5000 feet; secondly, this mass, or so much of it as was then in existence, was upheaved to the extent of from 1000

* Captain Barrow, U. S. Navy, found the greatest depth of the N. Atlantic to be, between the Virginian shore and Madeira, at a spot where the lead sank 33,000 feet.

to 2000 feet. Evidence that at least part of Madeira is of submarine origin is afforded by fragments of limestone embedded in basalt and tuff at S. Vicente, near the northern coast. Although the structure of the limestone has been much changed by heat, the genera of its corals and marine shells can still be identified. But it seems to be only the nucleus of the island that yields any trace of a submarine origin; the upper two-thirds at the centre, and all the exterior beds down to the coast, are apparently of supra-marine formation. That there were pauses of considerable duration in the accumulation of the materials of the island is shewn by several facts. The lignite and leaf-bed of S. Jorge, lying under 1200 feet of lavas, prove that time was allowed for the creation, the growth, and the decay of a vegetation of a high order. The red tufaceous layers frequently found between beds of basalt, are supposed to be altered soils, for in some of them carbonized branches and roots of trees have been discovered. It is clear, moreover, that great alterations and dislocations had taken place in the rocks of various localities before other lavas and tuffs were in existence. For instance, near Porto da Cruz, on the north coast, there is a great series of nearly horizontal trachytes and trachytic tuffs lying unconformably upon older basalts and tuffs, which had been previously tilted and eroded into ravines. Again, the newest part

of Cabo Giraõ, a lofty sea cliff near Funchal, consists of alternating lavas and scoriæ, inclined at an angle of 30°, upon which have been thrown some nearly horizontal lavas and tuffs proceeding from vents to the eastward.

There does not appear to be any data for determining when volcanic action first commenced in this locality; but the fossils of S. Vicente, though scanty, afford evidence that the upheaval of that portion of the island at least took place during or subsequent to the Miocene tertiary epoch. Nor is anything clear as to the period of the cessation of volcanic action. At the present day the subterranean fires seem perfectly extinct. There are no live craters, nor smoking crevices as at the Canaries and Cape Verdes, nor hot springs as at the Azores. On the slopes which descend from the central ridge to the sea, especially in the neighbourhood of Funchal, there are many hills with conical shapes of more or less regularity, which seem to have been formed at a comparatively modern epoch. Volcanic cinders and slag are lying upon several of them, which look as if they had been thrown out of a furnace yesterday. Yet round the base of others there may be traced streams of lava flowing from a higher source, and shewing that subsequent to the construction of these lateral cones, modern as they look, molten matter issued from higher vents which assumed on cooling the character of ordinary compact basalt.

If we examine the general configuration of Madeira we shall see a mountain chain about twenty-seven miles in length running E. and W., and throwing off lateral ridges that give it an extreme breadth of about twelve miles; peaks rising about the middle to a height of more than 6000 feet; and deep ravines lying between the lateral ridges, and striking for the most part N. and S. from the central chain to the sea. In the sections afforded by the ravines the nucleus of the island is seen to consist of a confused mass of more or less stratified rock ("an accumulation of scoriæ, agglomerate, and other materials, such as may have been piled up in the open air in or around the chief orifices of eruption and between volcanic cones"), upon which rest beds of tuff, scoriæ, and lava in the shape of basalt, trap, and trachyte, the whole traversed by dikes. These beds are thinnest near the central axis; as they approach the coast they become thicker and less intersected by dikes. They do not often exceed 1500 feet in thickness, but a section in the Curral shews that they have there a thickness of 3000 feet. Near the axis their angles vary from 3° to 7°, but two or three miles away they are inclined at angles of 10°, 13°, and even 20°. Sir Charles Lyell (who has examined Madeira more recently and more carefully than any other geologist) is of opinion that these lavas issued for the most part from vents situated in the central dis-

trict; that the form originally possessed by the whole island was that of a flattened dome with sides varying in their slope from 3° to 7° or 8°; and that the present steeper inclinations of the lava was acquired at a subsequent period when shaken by convulsions which attended eruptions from lateral vents, whether clefts or craters, at a much lower elevation.

If we climb up to the central axis, and take our station upon one of the highest peaks, Arrieiro, for instance, or Pico Ruivo, we find ourselves surrounded by several summits of nearly the same altitude, in some places connected by narrow walls and ridges which are frequently quite impassable, at others separated by ravines of enormous depth. On all sides are seen vertical dykes, projecting "like turrets above the weathered surface of the softer beds; hence the broken and picturesque outline, giving a singular and romantic character to the scenery of the highest part of Madeira." Sir C. Lyell found the materials of many of these peaks arranged with a quâ-quâ-versal dip, and he therefore considers them to be the ruins or skeletons of cones of eruption.

In various parts of the island may be seen elevated tracts of comparatively level ground. These are supposed to have been formed by the meeting of numerous streams of lava flowing from cones and points of eruption in close proximity,

various ejectamenta assisting at the same time to fill up inequalities. Deep down in the lateral ravines, covered by beds of basalt, there exist cones of eruption which have been overwhelmed by streams of melted matter issuing from the central region, and afterwards exposed to view by the same causes that excavated the ravines. Sir C. Lyell regards these ravines as having been formed at first by subterranean movements, both gradual and violent, which dislocated the rocks, and cut channels along which streams flowed to the sea. In course of time, the waters, periodically swollen by melted snows and the copious rains of winter, would eat deeper and deeper into the heart of the mountains, and would undermine the lateral cliffs until the valleys became as wide as we now find them. The same geologist says, that if we consider the height of the central ridge, and its short distance from the sea, we may be prepared for almost any amount of denudation effected simply by subäerial erosion. Even the Curral, which, from its position in the centre of the island, its rounded shape, and other circumstances, has been usually deemed the ruins of a crater, he thinks is nothing more, vast as it is, than a valley scooped out in the way described.*

* Speaking of the processes of denudation and weathering, Dr. J. D. Hooker in his "Himalayan Journal" says,—"The further we travel and the more we study, the more positive becomes the conviction that the part played by these great agents in sculpturing the surface of our planet is as yet but half understood."

The absence of crateriform cavities in Madeira is very remarkable; for though the experienced eye of a geologist may detect their remains in many parts of the island, their walls have been so pared down and defaced, and their hollows so filled up, that it is now very difficult for any one else to trace them. There exists, however, to the E. of Funchal, on a tract 2000 feet high, the Lagoa, a nearly perfect crater, 500 feet in diameter, and with a depth of 150 feet; and there is another equally perfect in the district known as Fanal in the N.W. of Madeira, nearly 5000 feet above the sea.

The basalt, of which the largest part of the island is composed, offers very different appearances to the eye, according to the circumstances under which it was produced. The upper and lower surfaces of a stream of basalt are generally scoriaceous, arising from the access of air and moisture when still melted, whilst the interior is compact, and forms a hard tough rock, with a conchoidal structure. Cómpact basalt is frequently rudely divided into vertical columns, with from three to six sides. A good section of a cluster of such columns is exhibited near the sea at the Gorgolho. Sometimes a mass of basalt is divided into thin adherent laminæ, wearing a schistose appearance. In some places it is found with a vesicular structure, the effect of imprisoned gases

trying to effect their escape whilst the substance was still plastic, the cells being elongated in the direction of the stream; and the cavities occasionally contain minerals such as stilbite. The compact rock often contains crystals of black augite and green olivine. Above the height of 1200 feet, the rock is frequently altogether composed of a blackish felspar, forming a compact felspathic trap, with much olivine; and it has a tendency to separate into spheroidal masses several feet in diameter. In the bed of the Socorridos ravine has been found a mass of basalt full of small cavities lined with acicular crystals of mesotype or zeolite, here and there interrupted by crystals of lime sometimes an inch long. There will be noticed a good deal of red rock, containing lumps of dark scoriaceous basalt, the whole simulating a conglomerate. From this, by the decay of the softer parts, rolled and twisted stones are separated, and the rock is therefore often referred to as 'ropy' basalt. Specimens of these stones, which evidently received their contortions when they were in a pasty state, may be picked up by hundreds on the side of Pico da Cruz, near Funchal, which cone seems to be one of the newest parts of the island. At the same place will be found numbers of pear-shaped volcanic bombs.

Sir Charles Lyell refers (Man. 5th ed. p. 522) to the singularly recent aspect of a basaltic lava

at Porto Moniz, which is still rough and bristling, whilst traversed here and there with channels characteristic of lava currents. The same phenomena may be equally well seen on the coast near the Gorgolho.

The ordinary compact basalt is termed by the native masons *Pedra viva;* whilst a porous and extremely tough basalt, which is much used, from its excellent working qualities, for door posts and window sills, bears the name of *Cantaria rija.*

The beds of tufa are soft and friable, and usually of a yellow colour; but where a hot stream of basalt has been poured over this rock, the colour of the latter has been changed to red, and it is sometimes seen to assume a columnar structure from the same influence, in which state it has received the name of *laterite.* Along with the tufa there are often beds of black ashes, and thin seams of pumice (*fajoco branco*). When the black ashes have been rendered tolerably compact by pressure, the mass is worked as a soft building stone which is called *Cantaria molle.* The compact red tufa likewise bears this name when used for the same purpose.

The trachytic rocks are much less abundant than those of the basaltic series. White and grey trachytes may, however, be seen in several places (Porto da Cruz, Pico dos Bodes, Little Curral, etc.), and their position in some localities contradicts

the received theory of the precedence in point of time of trachytic to basaltic eruptions.

In a ravine near Porto da Cruz there are some dikes and veins of sienitic greenstone traversing compact greenstone. The former is highly crystalline, and resembles granite to the eye, but it is composed of felspar and augite only. Near the same place is an angular mass of sienitic greenstone *in situ* which seems to have been pushed up from below when in a solid state. A similar rock occurs at the Azores, and in Fuerteventura. Near the Portella, in the Curral at the foot of Sidrão, and low down in Ribeiro Metade, is more compact greenstone in the shape of dikes.

As to the limestone at S. Vicente, there are three narrow beds or veins horizontally disposed, and in close proximity to each other, which are disclosed in a cleft on the east side of the valley at the height of about 1200 feet above the sea. The place is well known in the valley as Forno de Cal. The total thickness of all the beds is from 40 to 50 feet. They are surrounded by basalt, are intersected by thin seams of that rock, and their structure has been rendered crystalline by heat. The tuff which accompanies the limestone contains marine shells and corals (a list of which will be given hereafter), and includes rounded fragments of volcanic rocks.

The lignite above mentioned is a black mass of impure carbonaceous matter, resting upon a bed of indurated clay of a dark grey colour in the ravine of S. Jorge, with 1200 or 1500 feet of erupted matter above it, and at a height of perhaps 1000 feet above the sea. On analysis it yielded 60 per cent of carbon, and 20 per cent of ash. It has been considered the dried relict of an ancient peat bog; but Sir C. Lyell suggests that it may have resulted from the accumulation at the bottom of an extinct crater of leaves and other vegetable matter (such as is seen in the Lagoa crater at the present day), and from the pouring into such a hollow of melted lava, which would thereupon carbonize the subjacent vegetable matter. In the immediate neighbourhood of this lignite is the recently discovered leaf-bed, where impressions upon a layer of tuff or indurated clay of the fronds of ferns and the coriaceous leaves of dicotyledonous plants have been found in abundance. The impression of the wing cases of a beetle has also been detected here.*

* The reader is referred to Professor Heer's memoir, *Ueber die fossilen Pflanzen von San Jorge in Madeira; Zurich*, 1855—where the beetle and leaf impressions are figured. Sir C. Lyell informs the editor that he obtained impressions of the leaves of several species of plants which do not appear to have been seen by Professor Heer, and that altogether the remains of about 40 species have been discovered. The facts disclosed by the rocks of Madeira call to mind a passage in one of the works of our great geologist; and we may apply to the microcosm of Madeira what was originally written with reference to the macrocosm of the planet. "The earth's surface has been remodelled again and again; mountain

Since the leaf-bed and lignite of S. Jorge have no greater elevation above the sea than about 1000 feet, whilst the limestone of S. Vicente has an altitude of at least 1200 feet, there seems to be evidence here that the force which raised the latter above the level of the ocean did not act over the whole island.

On the neck of land which forms the promontory of Saõ Lourenço, there exists near Caniçal a bed of calcareous sand containing many dead land or fresh water shells, amongst which between 30 and 40 species have been made out, but of these only five appear to have no living members in Madeira.

At the same place are found, partly buried in the sand, partly protruding into the air, long ramiform pieces of carbonate of lime, which have given rise to much difference of opinion amongst observers. Some have attributed an animal origin to them; one naturalist referring them to the family of Alcyonidæ, another to corals. On the other hand, they have been described as nothing more than fantastic forms of calcareous infiltration. Mr. Darwin is of opinion that they were formed by fine calcareous matter being washed into the casts or cavities left by the decay of branches and roots of thickets buried under drifted sand; and states that

chasms have been raised or sunk; valleys formed, filled up, and then re-excavated; sea and land have changed places; and throughout all these revolutions animal and vegetable life has been sustained."

exactly the same forms have been found in New Zealand, Bermuda, and the Cape of Good Hope. The bodies from Caniçal were found on analysis to contain rather more than 4 per cent of animal matter (Dr. Macaulay); but this may have been owing, as suggested by Mr. Darwin, to the particles of comminuted shells and corals with which the sands abound.*

In many volcanic countries there are found subterranean channels formed by streams of lava, which, cooling at the top, bottom, and sides, have thus built around themselves walls of solid materials, whilst the lava was still fluid in the middle of the conduit it had made. When the stream had discharged itself, there remained of course a hollow channel. Only one such channel appears to have been hitherto discovered in Madeira, and that is to be found in one of the most modern streams of lava which flowed along the bottom of the valley of S. Vicente. This channel is about 100 yards long, five or six yards wide, and ten feet high. There is another cavern in the neighbourhood of the Quinta de S. Anna, Machico, which can be entered for 100 yards, but in some places the passage contracts so much that a person is obliged to creep on his hands and knees. As the floor slopes downward from the mouth, its origin has probably not been owing to

* Geological Observations on Volcanic Islands, by Charles Darwin, 1844, p. 146.

the same cause as that which produced the channel in S. Vicente.

Another curious phenomenon which volcanic countries sometimes exhibit, is that of a stream of lava falling like a cascade over an ancient cliff. A good example of this was observed by Sir C. Lyell in Palma; and Captain Vidal records an instance near Porto Moniz in Madeira, which Mr. Hartung, a later observer, is able to confirm. In the recent eruption from Mauna Loa, a volcano in the island of Hawaii, a current of intensely bright lava was observed to pour over a height of 25 feet, at first in a broken stream, at length as a continuous torrent, striking on a ledge, and then sliding off into a deep pool below.

Of the salient dikes which are strikingly displayed in several valleys in the interior of the island, we have already spoken. Dikes may also be seen in section at many places on the coast. They are very numerous at C. Giraõ, where in addition to vertical dikes, there are oblique and horizontal dikes intruding between layers of volcanic materials previously accumulated above the level of the sea. There are a few in the neighbourhood of C. Garajaõ; and the tufa forming the promontory is intersected by one which forms a conspicuous boss at the top. Between Machico and Caniçal are several dikes varying from six

inches to six feet in width; nine have been counted here in a distance of 200 feet. One dike is sometimes seen to cross another. At C. Giraõ there is a remarkable instance of this, where a broad dike inclined at an angle of 45° is cut through by several others which are nearly vertical. Dikes are sometimes seen to terminate with a pointed extremity upwards, at others with a pointed extremity downwards, in which latter case we may frequently infer that they were filled with lava from above. There is an example of this in the Ribeiro das Piornaes, between Funchal and Caniço. Perhaps the central dike in the conical hill of *Piedade* near Caniçal may have been thus formed, since it is cut off near the base by a nearly horizontal bed, though at first sight it has the appearance of being the feeder of an eruptive vent. One dike inside another may be seen on C. Giraõ, near the old road from Funchal to Campanario. The matter composing dikes is usually split at right angles to the cooling surfaces, in other words, to the walls; but Mr. Dana states that in the broad dike, in the hill near Caniçal, on which stands the *Capella de N. S. da Piedade*, the lines of fracture are parallel with the walls.

In various localities (*e. g.* on the south side of Pico da Cruz), will be observed small quantities of tufaceous carbonate of lime. These probably owed their origin to springs charged with the carbonate,

such springs being common in regions of spent volcanoes.

Great landslips have occurred at various times in Madeira, and evident indications of them may be seen at many places along the coast, Fajaa d'Ovelha, Paül do Mar, etc. The Arco de Saõ Jorge was formed by an enormous landslip. Major Azevedo discovered at Lisbon a letter disclosing the event, written in 1689, from a gentleman in Madeira to his friend in Portugal. About half a league of land was carried down towards the sea, and so gradual was the movement, that houses and walls were borne along without being thrown down. It was even stated that a hen, sitting on her eggs, and a hive of bees, were not disturbed. A landslip recently took place at Machico, by which a piece of ground measuring between two and three acres had been shifted (April 1856) to the extent of 36 feet, and the movement had not then ceased. Some huts upon this strip of land were thrown down.

Slight shocks of earthquake are occasionally felt at Madeira. At the time of the great Lisbon earthquake of November 1755, a violent shock, accompanied by noise, was experienced at Madeira. On this occasion the doors and windows of the houses were rapidly shaken; and one hour and a half afterwards the sea at Funchal suddenly rose fifteen feet, and immediately sank again. This

alternate rising and falling occurred four times, and then the sea returned to its ordinary state. It is recorded that on the occasion of a shock which occurred in January 1816, the ceilings of the houses were cracked, and their inhabitants thrown against the walls. The same earthquake was felt at Lisbon and the Azores.

The mineral contents of the rocks of Madeira are unimportant. There are no metallic mines; but iron pyrites and a small quantity of specular iron have been found at Ponta de Sol; and Rathke is said to have detected native lead. The lignite is too impure for use as fuel. No sulphur has been found, nor any pitchstone, though both occur at the Canaries and the Azores. The cold mineral spring of S. Antonio, near Funchal, is impregnated with carbonate of iron and small quantities of the muriates of soda and magnesia; but no sulphates have been detected.

At Porto Santo the trachytic rocks bear a much greater proportion to the basaltic than in Madeira. In Baixo, an adjacent islet, is a mass of calcareous rock, apparently an elevated coral reef, which abounds with organic remains of the Miocene tertiary epoch. The associated tuffs also include organic remains indicating a submarine origin; whilst waterworn pebbles in a cement of carbonate of lime show traces of an ancient beach.

The British Museum contains a suite of fossils

from Madeira and Porto Santo, chiefly collected by Sir Charles Lyell during his visit to those islands. Mr. S. P. Woodward of the Mineralogical Department has been good enough to communicate to the editor the following list of them, in which P. indicates Porto Santo; and V. Saõ Vicente, whilst the asterisk is attached to those species which have been found living. The shells from the calcareous deposit are for the most part only casts, and the species are therefore distinguished with difficulty. But the shells themselves are found fossilised in the tufa adjoining the limestone in Baixo, and an enterprising geologist might doubtless here collect excellently preserved specimens, and add considerably to the list given below.

UNIVALVES :—*Conus* (3 sp.) P; *Fasciolaria*, P; *Ranella*, P; **Cassis sulcosa?* P; *Cypræa* (2 sp.) P. V; *Cerithium*, P; *Vermetus*, P; **Haliotis tuberculata*, P. BIVALVES :—**Ostrea*, P; **Pecten Jacobæus*, V; *Pecten* —— ? P; **Lima squamosa*, P. V; *Spondylus gœdaropus*, P; **Avicula Tarentina*, P; *Mytilus*, (4 sp.) P; *Lithodomus lithophagus*, P; *Lithodomus* —— ? P; *Arca* (2 sp. ?) P; *Chama*, P; **Pectunculus*, P. V; **Cardium echinatum?* V; *Cardium* aff. *lyrato*, P; *Cardium* ——? P; *Lucina* or *Ungulina*, P; **Diplodonta*, P. V; **Cardita calyculata*, P; *Cardita* —— ? P; *Isocardia*, or *Cypricardia*, P; *Coralliophaga*, P;

Venerupis, P; *Venus*, P; **Cytherea Chione*, P; *Gastrochæna*, (2 sp.) P; *Clavagella*, P.

In addition to the shells there have been found a species of Sea Urchin (*Clypeaster*) at S. Vicente,* and another at P. Santo, where fragments of spines of *Cidaris* abound. The corals are very plentiful, and belong to several species, including a *Caryophyllia* and 2 sp. of *Astræa*. Beautiful casts of a shell-eating Sponge (*Cliona*), may be frequently found attached to the remains of Testacea.

At a raised beach of quite modern formation, shells of the following species, all of them recent, have been collected:—*Pectunculus glycimeris*, *Cardium rusticum*, *Cytherea Chione*, *Patella guttata*, *P. Lowei*, *Purpura hæmastoma*, *Cassis sulcosa*, and *Monodonta crassa*.

The reader will obtain fuller information on the geology of Madeira from the works mentioned below. Sir Charles Lyell is at present occupied with a memoir on this subject, which will probably be published in the spring of 1857.

Excursions in Madeira and Port Santo, during the autumn of 1823, by T. E. Bowdich. London, 1825.

United States Exploring Expedition, vol. x. Geology by J. D. Dana. Chap. xii. Geological Observations on the Island of Madeira (1838).

* Dr. Lister obtained a very perfect specimen of a *Clypeaster* from the S. Vicente limestone.

On the Geology of Madeira, by James Smith, Esq. Proceedings of the Geological Society, vol. iii. p. 351. 1840-41.

Sketch of Madeira, by E. V. Harcourt, Esq. London, 1851. Chap. vi. on Geology, by the Rev. W. V. Harcourt.

On the Geology of some parts of Madeira, by Sir Charles Lyell, F.R.S. Quarterly Journal of Geological Society, August 1854.

A Manual of Elementary Geology, by Sir Charles Lyell, F.R.S. 5th Edition, 1855, chap. xxix. pp. 515-522.

The Population, Births, Marriages, and Deaths in Madeira and Porto Santo in 1854 *from Official Returns.*

1854. Concelhos (Municipalities).	No. of Parishes.	No. of Families.	Inhabitants.			Births.			Deaths.			Marriages.
			Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	
Funchal	9	7,807	13.351	16,085	29,436							
Camara de Lobos	5	2,446	5,682	6,544	12,226	221	204	425	93	76	169	65
Ponta do Sol	6	3,096	6,647	7,355	14,002	276	251	527	188	147	335	98
Calheta	7	2,685	5,167	5,990	11,157	225	218	443	96	105	201	80
Porta Moniz	5	1,376	2,642	2,914	5,556							
Saõ Vicente	3	1,747	3,388	3,491	6,879							
Sant Anna	5	1,795	3,704	3,525	7,229	134	144	287	97	94	191	36
Machico	5	1,774	3,457	4,005	7,462	92	97	189	38	44	82	29
Santa Cruz	4	1,691	3,778	3,863	7,641	102	72	174	56	71	127	44
Total of Madeira	49	23,417	47,816	53,772	101,588							
Porto Santo	1	422	839	866	1,708	45	50	96	28	22	50	7
Grand Total	50	23,839	48,655	54,638	103,296							

In 1768 the population amounted to 63,913 according to Forster. In 1813 to 90,916, and in 1823 to 98,000, according to Bowdich. In 1835 the government returns gave 115,446 persons; in 1849, 110,084; in 1854, 103,296; in 1855, 102,837; shewing a decreasing population for some years. The decrease is accounted for by the emigration which has taken a large portion of the ablest part of the community to Demarara and the British West Indies. In 1841, the number of emigrants amounted to 4045; in 1846 to 4945; in 1847 to 4720; in 1853 to 3060. During the 20 years ending with 1855, upwards of 20,000 persons, emigrated according to the government returns; and it is thought that nearly an equal number left the island clandestinely, in order to evade the passport duty.

APPENDIX B.

Number of Permanent and Temporary British Residents in Madeira on 31st December of the following years.

Years.	Permanent.	Temporary.	Years.	Permanent.	Temporary.
1845	293	357	1851	290	430
1846	284	316	1852	280	335
1847	271	349	1853	280	310
1848	282	378	1854	280	295
1849	284	376	1855	280	285
1850	280	330			

APPENDIX C.

List of Foreign Consuls in Madeira:—

America (U.S.)..... J. H. March, 10 Praça de Constituicaõ.
Austria ..... J. A. Bianchi, Pontinha.
Belgium..... Roberto Leal, 19 Rua das Merçes.
Brazil..... Luiz T. Miranda, V. C., 6 Rua das Rosas.
Denmark ..... J. W. Selby, 4 Rua dos Nettos.
England..... George Stoddart, Rua de Peru, Largo do Collegio. George Hayward, V. C.
France ..... José Monteiro, 6 Rua do Aljube.
Greece ..... J. A. Bianchi (V. C.), Pontinha.
Hanseatic Towns.....
Holland..... Pedro G. Monteiro, 6 Rua do Aljube.
Naples ..... José C. Dellanave, Calçada da Bella-Vista.
Ottoman ..... Vacant.
Papal States ..... Candido de Freitas Abreu, 6 Rua d'Amoreira.
Prussia ..... J. Hasche, 15 Calçada da Sta. Clara.
Russia..... J. J. Bernes, V. C., 32 Rua da Carreira.
Sardinia..... Joaõ Antonio Bianchi, Pontinha.
Spain ..... Lea Bermudas, Consul. Joaquim Salles, V. C., 13 Rua de Joaõ Tavira.
Sweden ..... José Santanna, Consul. Pedro G. Monteiro, V. C., 6 Rua do Aljube.
Tuscany ..... J. A. Bianchi, Pontinha.

APPENDIX D.

		Cereals.	Legumes.	Potatoes.	Inhame.
Harvest, 1854) (In Alqueires)	Madeira	291,332 (113,250 bsh.)	25,124 (9765 bsh.)	206,187 (80,100 bsh.)	457,902 (178,066 bsh.)
	P. Santo	28,398 (11,040 bsh.)	120	40	
Estimate of the quantities required for the years' consumption.	Madeira	823,870	67,555	25,540	45,792
	P. Santo	122,254	100	60	
Estimate of quantity required for following year's seed.	Madeira	38,505	2,483	29,536	
	P. Santo	2,930	10	4	

The total quantity of grain imported in 1854 was 216,293 bushels, which was nearly twice as much as the produce of the island.

APPENDIX E.

Table showing the Number, Tonnage, and Nations of the Vessels entering the Port of Funchal during 1855.

Nations.	Ships of War.		Merchant Ships.	
	Number.	Guns.	Number.	Tonnage.
British	3	238	117	56,699
Portuguese	1	4	80	19,509
United States	5	129	10	2,786
French	7	33	4	879
Brazilian	...	...	3	1,900
Dutch	2	56	1	477
Spanish	2	6	3	422
Sardinian	...	...	1	217
Hanoverian	...	...	2	143
Hamburgh	...	...	2	168
Bremen	...	...	1	199
Danish	1	16		
Total	31	482	224	83,299

APPENDIX F.

Vessels Entered at the Port of Funchal annually since 1841.

Year.	War.	Mer-chant.	Total.	Year.	War.	Mer-chant.	Total.
1841	54	295	349	1849	58	279	337
1842	70	296	366	1850	75	277	352
1843	62	302	364	1851	56	318	374
1844	57	320	377	1852	87	278	365
1845	85	237	322	1853	79	332	411
1846	73	334	407	1854	43	297	340
1847	86	320	406	1855	30	252	282
1848	74	287	361				

APPENDIX G.

Tables of Moneys, Weights, and Measures used in Madeira.

Accounts in Madeira are kept in reis, an imaginary coin, one of which is equal to one-fifth of a farthing; 1000 reis being *mil-reis*, or one dollar. The coinage has the great advantage of being decimal, as in France and the United States. It is remarkable that the coins of Portugal do not circulate in Madeira, where only British, American, and Spanish coins are met with. The *reis* of Portugal and Madeira have different values; in the mother country 4500 equal the pound sterling; in Madeira 4800.

PORTUGUESE COINS.

	Reis		£	s.	d.
Copper.	5	Cinco-reis	= 0	0	0¼
	10	Dez-reis	= 0	0	0½
	20	Vintem	= 0	0	1

SPANISH COINS.

	Reis.		£	s.	d.
Silver.	50	Meio Testaõ, or half-bit	= 0	0	2½
	100	Testaõ, or bit	= 0	0	5
	200	Dois Testões, or pistareen	= 0	0	10
	1,000	Pataca, or dollar	= 0	4	2
Gold.	2,000	One-eighth doubloon	= 0	8	4
	4,000	Quarter doubloon	= 0	16	8
	8,000	Half doubloon	= 1	13	4
	16,000	One doubloon	= 3	6	8

ENGLISH COINS.

	£	s.	d.			Reis.
Gold & Silver.	0	0	6	Sixpence	=	120
	0	1	0	Shilling	=	240
	0	2	6	Half-crown	=	600
	0	10	0	Half-sovereign	=	2,400
	1	0	0	Sovereign	=	4,800

AMERICAN COINS.

	Cents.		£	s.	d.		Reis.
Silver.	5	Half-dime	= 0	0	$2\frac{1}{2}$	=	50
	10	Dime	= 0	0	5	=	100
	50	Half-dollar	= 0	2	1	=	500
	100	Dollar, U. S. or Mexican.	= 0	4	2	=	1,000
Gold.	250	Quarter-eagle	= 0	10	5	=	2,500
	500	Half-eagle	= 1	0	10	=	5,000
	1,000	Eagle	= 2	1	8	=	10,000
	2,000	Double-eagle	= 4	3	4	=	20,000

Reckoning 25 francs to be the value of the pound sterling, the franc is equal to 152 reis, and the *mil-rei* has a value of about 6 francs and a-half. As to German money, 20 reis = 3 kreuzer, or nearly 3 silver groschen, and the *mil-rei* = 2 gulden, 30 kreuzer, or 1 thaler 13 groschen.

Rate of Exchange on Bills in Madiera.

At the *par of exchange* between Madeira and London, a *mil-rei*, or dollar, is equal to 5s. 6d., and a pound sterling to 3636 reis. The sovereign, however, by a decree of the Portuguese Government, being current in Madeira at 4800 reis, gives 4s. 2d. for a mil-rei, or 32 per cent. premium on the *par of exchange*. The premium, or rate of exchange on bills in Madeira, fluctuates according to the demand. The following Table will shew the value, in Madeira currency, of £100 sterling, according to the premium, from 25 to 36 per cent.

Premium.	Madeira Currency.	Premium.	Madeira Currency.	Premium.	Madeira Currency.
Per cent.	Reis.	Per cent.	Reis.	Per cent.	Reis.
25	454,545	29	469,091	33	483,636
26	458,182	30	472,727	34	487,273
27	461,818	31	476,364	35	490,909
28	465,455	32	480,000	36	494,543

Weights.

72	Graõs	= 1	Oitava	=	2	Drams,	Avoirdupois.
8	Oitavas	= 1	Onça.....	=	1	Ounce	„
16	Onças	= 1	Arratel, or libra	=	1	Pound	„
32	Libras	= 1	Arroba	=	32	„	„
4	Arrobas	= 1	Quintal.....	=	128	„	„
13⅓	Quintais	= 1	Ton, Portuguese.				
17½	Quintais ...	= 1	Ton, Avoirdupois.				

N.B.—These weights are 1⅛ per cent heavier than those of England.

Liquid Measure.

1	Quartilho	=	1¼	Gill,	Eng. Imp.
4	Quartilhos ...	= 1 Canada	or 2 7/10	Pints	„
14	Canadas	= 1 Almude.....	or 4	Gallons	„
23	Almudes.....	= 1 Pipa	or 92	„	„

Dry Measure.

2	Selamins.....	= 1 Maquia.....	or 1 1/20	Pints,	Eng. Imp.
16	Maquias ...	= 1 Alquiere	or 1 1/20	Pecks	„
4	Alqueires ...	= 1 Fanga	or 6⅕	„	„
15	Fangas	= 1 Moio	or 23¼	Bushels	„

Cloth Measure.

1	Covado	= 26¼ English Inches,	or nearly ¾	Yard.
1	Vara	= 43 „	or 1 7/36	„

N.B.—Woollens, silks, and printed cloths, are sold in Madeira by the Covado; linens, ribbons, and plain cottons, are sold by the Vara.

Long Measure.

12	Linhas	= 1 Polegada	or	1.1028	Inches, English.
8	Polegadas ...	= 1 Palmo	or	8.8244	„ „
1½	Palmo	= 1 Pe	or	13.2366	„ „
10	Palmos	= 1 Braça	or	2 Yds. 16.224	In. „
2500	Braças	= 1 Legoa	or	6,116 Yards(3.47	miles).
18	Legoas	= 1 Grao	or	62 Miles,968	Yds., Eng.
20	Legoas	= 1 De_ree, Eng...	or	69½ Miles	„

N.B.—The Portuguese long measure is seldom used in Madeira; the English scale of feet and inches being generally employed by builders, cabinet-makers, &c.

Square Measure.

976.5	Square palmos	=	1 Maquia.
16	Maquias (15,625 sq. palmos)	=	1 Alqueire.
80,625	Square palmos	=	5.16 Alqueires = British acre.

APPENDIX H.

List of Furnished Quintas and Houses usually to be let in and around Funchal.

Under £50 for the Season.

		Ft. above Sea.
Sñr. Pedro Jorge Monteiro		138
Sñr. Ant. Jozé da Souza	Portas Novas	86
Heirs of J. Ruffino	Santa Luzia	254
Mestre Francisco	Val Formoso	394
Sñr. Fr. A. da Silva	Angustias	77
Mr. F. Wilkinson	St. Antonio	642

From £50 to £75 for the Season.

Sñr. Roberto da Costa.....	Consolaço	516
Sñr. Ricardo Fonseca	Caminho da Torrinha.....	429
Sñr. J. A. da Silva Carvalho ...	Caminho do Monte	375
Sñr. Luiz S. Anna	Val, Caminho do Monte.....	311
Sñr. Alex. P. Cunha	Val, Caminho do Monte.....	323
Sñr. A. Sarstield	Casa Branca.....	238
Miss Araujo	Pombal	172
Sñr. H. d'Ornellas.....	Pombal	145
Sñr. J. Salustiano de Govea ...	Nora	126
Sñr. Ant. Gomes Camacho	Angustias	164
Sñr. F. A. Pestana	Ilheos-de-Cima	239
Sñr. F. S. Perreira	Caminho Novo.....	165

From £75 to £100 for the Season.

Sñr. Mathias Figueira	Camo. de Santa Luiza Velha	289
Sñr. Antonio Rabello	Rose Cottage, Caminho do Til	241
Sñr. Alex. Ferreira	Quinta d'Ambrosio	332
Sñr. Fr. de Andrade.....	Caminho da Torrinha.....	262
Sñr.Germano Soares.....	Quinta das Rosas, Portas Novas	89
Sñr. Ant. Ferreira.....	Caminho do Meio	146
Sñr. J. Caetano Jardim	Caminho do Meio	200
Sñr. Joaõ Jozé da Camara	Nora Pequena	120
Sñr. Pedro J. Monteiro	Achada	428
Sñr. F. Rods. da Govêa	Rua da Bella Vista, Carreira	97
Mr. J. Johnson	Travessa das Angustias	142
Mr. Wm. Grant.....	Pontinha	18
Sñr. Conego Sà.....	Socorro	61

From £100 to £125 for the Season.

Sñr. Joaõ Fr. Nunes.....	Saltos	494
Sñr. Tristaõ da Camara	Pinheiros	498
Sñr. Fr. de Andrade.....	Caminho da Torrinha.....	304
Sñr. F. Placido da Veiga.....	Levada	494

		Ft. above Sea.
Sñr. Morgado Vellosa	Val Formoso	281
Sñr. J. F. dos Santos	Val	347
Sñra. J. J. R. d'Olivera	Val do Meio	298
Sñr. Ant. Jozé	Tangerina, Lower Val	277
Sñr. J. H. dos Santos	Santa Luzia, Mount Road	262
Sñr. Alex. P. Cunha	Caminho do Meio	202
Sñr. Fr. Jurino	Boa Vista, Caminho do Meio	385
Sñr. Julio U. Fernandes	Ilheos	123
Mr. J. Payne	Ilheos	120
Mr. Wm. Newton	Ilheos	119
Sñr. Fr. L. Perreira	Caminho Novo	188
Sñr. Joaõ Murteiras	Bella Vista	155

From £125 to £150 for the Season.

Sñr. C. A. Pimenta	Quinta dos Saltos	384
Sñr. Domingos A. da Costa	Caminho da Torrinha	284
Sñr. Candido J. F. Abreu	Val	338
Sñr. Sebastiaõ Leal	Mount Road	292
Morg. J. F. Florença	Ilheos	119
Sñr. J. A. Bianchi	Ilheos	112
Mr. Wm. Newton	Bella Vista, Ilheos	158

From £150 to £200 for the Season.

Sñr. Alex. Ferreira	Upper Ambrosio	368
Mr. Robt. Wallas	Caminho da Torrinha	280
Mr. J. Payne	Caminho da Torrinha	292
Mr. J. Payne	Ilheos da Cima	269
Sñr. Fr. da Silva	Cabouqueiro	141
Sñr. Fred. Bianchi	Caminho do Palheiro	369
Sñr. Vital C. de Freitas	Caminho da Torrinha	196

From £200 upwards for the Season.

Mr. Geo. Stoddart	Deanery, Santa Luzia Velha	245
Sñr. J. A. Bianchi	Ilheos	233

The rental of these furnished houses fluctuates considerably, according to the existing demand. They may generally be obtained for a whole year at nearly the same rates as are charged for the season, but are seldom let by the month, unless it be at a late period, or when few visitors arrive.

APPENDIX I.

List of Fish most Esteemed for the Table, with Average Weight and Price.

	Usual Weight.	
Abrotea	2 to 6 lbs.	each 5d. to 1s. 3d.
Alfonsim, costa larga	2 to 6 lbs.	„ 5d. to 1s. 3d.
„ „ estreita	1 to 2 lbs.	„ 4d. to 8d.
Anchova	2 to 30 lbs.	„ 5d. to 2s. 6d.
Boca-negra	1 to 2 lbs.	„ 1d. to 2d.
Bodeam	2 to 4 lbs.	„ 3d. to 6d.
Bodejo	3 to 10 lbs.	„ 4d. to 8d.
Boqueirão	1 to 2 oz.	20 for 1d.
Carneiro	1 to 3 lbs.	each 3d. to 6d.
Cavalla, *mackerel*	1 to 2 lbs.	5 for 3d.
Cherne, species of *Jew-fish*	3 to 30 lbs.	per lb. 2d. to 4d.
Chicharro, *horse-mackerel*	½ lb.	each 1d.
Coelho	1 to 3 lbs.	„ 3d. to 6d.
Enchareo	2 to 14 lbs.	„ 5d. to 1s. 3d.
Espada	2 to 8 lbs.	„ 3d. to 6d.
Gallo, *John Dory*	2 to 4 lbs.	„ 5d. to 1s. 3d.
Garopa, *grouper*	1 to 2 lbs.	„ 1d. to 2½d.
Goraz	2 to 6 lbs.	„ 5d. to 10d.
Guelro, *white-bait*		a platefull 5d.
Pargo, *braise*	1 to 12 lbs.	each 5d. to 1s. 3d.
Raquieme	1 to 2 lbs.	„ 1d. to 2½d.
Rubaldo	2 to 4 lbs.	„ 5d. to 6d.
Salmonete, *red mullet*	¼ lb.	5 for 5d. to 6d.
Id: do alto	2 to 4 lbs.	each 1s. 3d. to 2s. 6d.
Sardinha, *sardines*		a platefull 5d.
Sargo	about 1 lb.	each 1d. to 1½d.
Seifia	about 1 lb.	„ 1d. to 1½d.
Solha, *flounder*	about 2 oz.	10 for 3d. to 5d.
Pescada	2 to 16 lbs.	each 5d. to 1s. 3d.
Tainha, *grey mullet*	½ to 10 lbs.	„ ½d. to 1s.
Tartaruga, *turtle*	6 to 50 lbs.	„ 5d. to 4s.
Camarão, *shrimps*		a platefull 5d.

APPENDIX J.

Explanation of Local Appellatives.

Achada ; a ledge ; a level tract between two ravines.

Arco ; *Arco de Sao Jorge, Arco de Calheta ;* literally an arch or bow, applied to a curved mountainous ridge, and to the district inclosed by such a ridge.

Assomado ; a point with a view.
Beco ; a lane.
Boca ; a mouth, a gap.
Boqueirão ; a large mouth or gap.
Cabo ; a cape.
Calheta ; a small creek.
Caes ; a quay.
Caminho ; a road.
Calçada ; pavement.
Capella ; a chapel.
Calhaõ ; a beach.
Caramujo ; literally a spiral shell, applied to the windings of a mountain road.
Cidade ; a city.
Encumiada ; the crest of a range of hills.
Eremida ; a hermitage.
Estreito ; a ridge ; sometimes applied to an upland district, *Estreito de Camara dos Lobos, E. de Calheta.*
Fajaa ; a landslip.
Freguezia ; a parish.
Furado ; a rock that has been pierced or bored.
Igreja ; a church.
Ilha ; an island.
Ladeira ; a path up the side of a hill.
Ilheo ; an insulated rock.
Jardim ; a garden, *Jardim do Mar, J. da Serra.*
Largo ; an open space in a town.
Levada ; a watercourse.
Lombo ; Lombado ; applied to ground lying between two ravines.
Passeio, a walk.
Paül ; a marsh, from the Latin *Palus ; Paul da Serra, P. do Mar.*
Penha ; a high rock : the word is connected with the Welsh *Pen*, and the Scotch *Ben.*
Praça ; a public walk.
Pico ; a peak or pointed hill.
Praya ; a beach.
Ponta ; a point or promontory.
Quinta ; a country-house.
Ponte ; a bridge.
Ribeira ; Ribeiro ; a ravine, a river.
Pontinha ; a small point or bridge.
Rocha ; a rock.
Porto ; a harbour or port.
Rua ; a street.
Serra ; a mountainous tract, from the Arabic *Serah*, an uncultivated district.
Travessa ; a cross road.
Villa ; a town.
Vigia ; a look-out place.
Vista ; a view ; the place whence a view is obtained.
Voltas ; the windings of a road upon a slope.

APPENDIX K.

Time occupied on Horseback, at a walking pace, or by a Four-oared Boat during favourable weather, in various Excursions over the Island, or along the Coast, of Madeira.

		h.	m.
From Funchal to	Boa Ventura, by Torrinhas	7	0
„	Brazen-head	1	0
„	Ditto by boat	0	45
„	Calheta	8	0
„	Ditto, by boat,	4	25
„	Camacha	1	35
„	Cama de Lobos	1	30
„	Ditto, by boat	1	0
„	Campanario	3	45
„	Ditto, by boat (to landing-place)	2	30
„	Canhas	6	0
„	Ditto, by boat (to landing-place)	3	30
„	Caniçal, by boat,	4	0
„	Caniço	1	15
„	Cape Giraõ, summit	3	15
„	Ditto, by boat	2	0
„	Curral das Freiras, by Jardim	3	0
„	Ditto, view of, by S. Antonio	2	0
„	Ditto, Church of, by S. Antonio	2	55
„	Curral dos Romeiros, by Rocket-road & Mount	2	15
„	Ditto, by Palheiro to Mount	2	45
„	Encumiada de Saõ Vicente	5	45
„	Fayal, by Mount	5	0
„	Jardim da Serra	2	30
„	Lamoceiros	4	0
„	Machico	4	0
„	Ditto, by boat	3	0
„	Magdalena	6	30
„	Ditto, by boat	4	0
„	Mount Church	0	40
„	Palheiro do Ferreiro	1	0
„	Ponta do Sol	5	30
„	Ditto, by boat	3	30
„	Porto da Cruz, via Lamaceiros	5	0
„	Ribeira Brava	4	15
„	Ribeiro Frio	3	0
„	Sant' Anna	6	30
„	Sant' Antonio and Sant' Amaro	1	30
„	Sant' Antonio da Serra	3	30
„	Santa Cruz	3	0
„	Ditto, by boat	2	0
„	Saõ Jorge, via Sant' Anna	8	0
„	Saõ Roque, and round by S. Amaro	1	45
„	Saõ Vicente	7	30
„	Torrinhas, via Curral	4	15

		h.	m.
From Sant' Anna to	Arco de Saõ Jorge	2	45
„	Boa Ventura	3	30
„	Fayal	1	35
„	Machico { via Lamoceiros	6	20
	{ via Portella	5	35
„	Pico Ruivo, summit	3	30
„	Ponta Delgada	4	0
„	Porto da Cruz	3	10
„	Ribeiro Frio	3	20
„	Sant' Antonio da Serra { via Lamaceiros	5	0
	{ via Feiteiras	5	45
„	Saõ Jorge	1	30
„	Saõ Vicente	5	45
From Boa Ventura to	Torrinhas pass	3	0
„	Curral Church	4	15
„	Funchal, via Curral	7	15
From Saõ Jorge to	Arco de Saõ Jorge	1	15
„	Boa Ventura	2	0
„	Sant' Anna	1	30
„	Ponta Delgada	2	30
„	Saõ Vicente	4	15
„	Voltas (for viewing scenery)	1	30
From Machico to	Caniçal, by boat, N. S. da Piedade	1	0
„	Santa Cruz	1	0
„	Ditto. by boat	0	45
„	Sant' Antonio de Serra	1	20
„	Portella	1	45
From Sant' Antonio da Serra to	Santa Cruz, direct	1	30
„ „	Lamoceiros	0	50
„ „	Portella, via Lamoceiros	1	20
„ „	Porto da Cruz via Lamoceiros	1	30
From Calheta to	Fajaa da Ovelha	3	0
„	Paül da Serra and Rabaçal	2	45
„	Paül do Mar	4	0
„	Ponta do Pargo	5	0
From Saõ Vicente (from hotel) to	Calheta	7	0
„ „	Paül da Serra (ascent)	2	0
„ „	Ponta Delgada	1	45
„ „	Rabaçal	4	30
„ „	Sant' Anna	5	45
„ „	Saõ Jorge	4	15
„ „	Seiçal, by boat	1	0
„ „	Boa Ventura	2	15

Persons travelling in hammocks will find, by adding 15 minutes to every hour of the time occupied in performing the journeys on horseback, the average period required for performing the same journeys in a hammock.

APPENDIX L.

Altitude of various Mountains and Places in Madeira.

		Altitude in English Feet.
Camacha Church	A.	2,203
Caniçal Fossil Bed	A.	254
„ N. S. da Piedade	A.	342
Cape Giram	V.	1,934
Curral, bed of	B.	2,080
„ depth from above Jardim da Serra	B.	1,634
Jardim da Serra	B.	2,526
Lamoceiros Pass	A.	2,181
Mirante, Vista de Machico	A.	1,768
Mount Church	V.	1,965
Palheiro	V.	1,800
Paül da Serra	V.	4,611
Penha d'Aguia	V.	1,915
Pico do Arco de S. Jorge	V.	2,746
„ do Arieiro	V.	5,893
„ do Arrebentaõ	V.	3,844
„ dos Bodes	V.	3,725
„ do Canario	V.	5,449
„ do Castanho, Machico	V.	2,058
„ da Cruz, Campanario	V.	3,071
„ do Facho, Machico	V.	1,080
„ Grande	V.	5,391
„ da Lagoa	V.	4,762
„ da Neve, Ice-house	V.	5,346
„ d' Urze	V.	4,611
„ Ruivo	V.	6,050
„ Ruivo do Paül	V.	5,210
„ S. Antonio, Curral	V.	5,706
„ do Sidraõ, Curral	V.	5,500
„ das Torrinhas de Boa Ventura	V.	5,980
„ das Torrinhas (or Torres) de Poizo	V.	6,000
Poizo House	about	4,000
Portella Pass	A.	1,799
Roxtolho Moreira, N. of Machico	V.	2,510
Sant' Anna Hotel	V.	1,090
Sant' Antonio Church	A.	941
Sant' Antonio da Serra	A.	2,059
Sant' Antonio da Serra, edge of Lagoa	A.	2,289
Saõ Roque Church	A.	1,129

The altitudes marked A. were ascertained by an Aneroid barometer.

Those marked B. are from Bowdich's Observations.

Those marked V. were taken by Captains Vidal and Azevedo.

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